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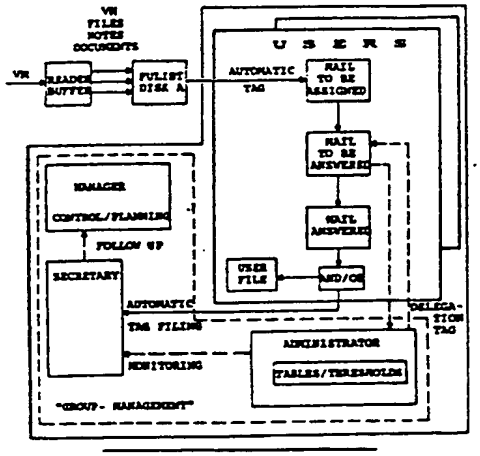
(54) Electronic mail follow-up system.

(57) In a data processing and transmission digital network wherein users have been individually assigned a virtual machine including a memory zone and means for sharing hardware and software facilities for entering processing and mailing data to one another using terminal keyboards attached to the network, a mail follow-up system is provided for monitoring and processing selected mail items. Said system includes means for generating mail tags including predefined fields; means for tracking the mail and deriving therefrom mail characteristic data; means for storing said characteristic data into tag fields; means for storing the filled-in tags into a file and for accessing and processing predefined mail fields, whereby processed tags are automatically transferred to different tag files. The system further includes administrator means for centrally administrating the tagged mail on a departmental basis.

F I G. 3



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ELECTRONIC MAIL FOLLOW-UP SYSTEM

Field of the Invention

This invention deals with information handling systems and more particularly with electronic mailing systems.

Background of Invention

Communications through digital networks are expanding at a fairly high rate. In other words, users attached to said networks exchange a lot of files through electronic mail, with some, if not most, of these files requiring action.

Obviously, with the advent of electronic mail, it has become increasingly difficult to keep-up with the incoming flow of exchanged files both at the individual, departmental and/or organizational levels. Organizing one's work/activity schedule has now become a real concern for the user, unless each file is printed and handled the archaic ways it used to be in the past. This would be an inefficient processing way for electronic mail and today's facilities preclude sticking to an outdated way of organizing and scheduling one's work.

Summary of the Invention

This invention addresses the mail follow-up problems and provides an efficient solution to these problems at both individual and departmental levels, for tracking, scheduling and in a broader sense managing electronic mail.

More particularly the invention addresses a system for automatically following-up mail to enable the addressee's (and/or sender) attention being automatically called upon received/sent mail, action to be taken, action taken, target dates for action and several other items of importance to mail processing.

The invention also addresses an improved system for a more elaborate mail follow-up within a predefined group of users (a Department) attached to the same electronic mail system, for enabling delegating mail processing, tracking by another individual the mail to be processed, automatically performing statistical operations, reporting to management level etc...

In other words, the invention provides means for processing electronic mail not only on an individual user stand alone basis but also on an elaborate group basis by adding coordinating means and group managing means.

Brief Description of the Drawings

Figure 1 represents a digital network node.

Figure 2 shows a user's machine with hard and soft facilities.

Figure 3 is a block diagram illustrating the invention.

Figure 4 is a block diagram illustrating functional keys operations while implementing the invention.

Figure 5 is a flow-chart illustrating the invention.

Figure 6 illustrates a mail follow-up operation.

Figures 7-10 and 12-19 represent flow-charts for implementing the follow-up system for a conventional user.

Figure 11 illustrates a filing facility.

Figures 20-23 are flow-charts for implementing secretary monitoring of followed-up mail.

Description of the Preferred Embodiment

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Represented in Figure 1 is a digital network node including both application resources and communication resources. Terminals T1, T2, ... for instance IBM 327X or 317X, i.e. intelligent displays, are attached to a host computer (IBM 3033) either directly, or through a concentrator or Communication Controller (IBM 3725) or a PBX for remote terminals. Several similar nodes are connected into a digital network leading thus to thousands of terminals attached to the network. Users sitting at any terminal do both perform selected tasks using the network software resources, and communicate with each other at will, day and night, by simple keyboard operations.

Assume the system including the host computer is operating in a VM/SP environment. Each person, or end user, is assigned a Virtual Machine (machine) in the computer system within a given node of the network. Virtual Machine means in fact a predetermined size memory location and authorization to share common computer hardware and resources, essentially including the IBM Control Program (CP) and Conversational Monitor System (CMS), each including its own types of services. CP manages system resources and provides an individual working environment for each person using the system. Resource managed by CP include : Processor functions; processor storage and input/output devices. CP creates the system work environment. It controls the system resources that are available to the user during a work session.

CMS, although a component of VM/SP operating system, is itself an operating system running under CP. AS the name "conversational" implies, there is a two way communication between the system users and CMS.

For more detailed information on IBM CP and CMS one may refer to the following IBM documents :
- Virtual Machine/System Product : CMS Command and Macro Reference, SC19-6209.
Virtual Machine/System Product : CMS USER'S Guide, SC19-6210.
- Virtual Machine/System Product : CP Command Reference for General Users, SC19-6211.
- Virtual Machine/System Product : System Product Editor User's Guide, SC24-5220.
- Virtual Machine/System Product : System Product Editor Command and Macro Reference, SC24-5221.
Virtual Machine/System Product : System Product Interpreter User's Guide, SC24-5238.
- Virtual Machine/System Product : System Product Interpreter Reference, SC24-5239.
- Document Composition Facility : Introduction to the Generalized Markup Language : Using the Starter Set, SH20-9186.

As illustrated in Figure 2, a user may initiate a session using any of the terminals attached to the network, and through a log-on procedure reach his/her machine. Logging-on means sending an interrupt command from the keyboard to reach CP facilities and then identifying himself to the system by typing his identification code (userid) and in most cases a password. Then CMS resources and/or any other software resources (e.g IBM PROFS application programs) may either be accessed or request or be accessed directly. This is defined in the user's PROFILE EXEC routine tailored to identify the available resources assigned (i.e. mode available) to the specific user upon originally defining his machine. For more detailed information on PROFS one may refer to the following IBM documents :
- Getting Started with the Professional Office System (Order No. SH20-5602)
- Using the Professional Office System (Order No. SH20-5604)
- Quick Reference to PROFS (Order No. GX20-2408)
- Using Line-Mode Support with PROFS (Order No. SH20-5607)
- Programmer's Guide to the Professional Office (Order No. SH20-5606)

Eventhough, the mail follow-up system of this invention applies to both received and sent mail, it will be described more particularly, hereunder, with reference to received mail. Among the resources most users may access, are text processing software to enable generating text files named with a file identification (file name) and storing these in the memory section assigned to said user or in a central memory location shared by several users. When a user (U1) needs sending a file filenamed (X) to a user (U2), mailing resources have to be accessed by (U1). Then, by attaching routing data to file (X), said file is routed toward (U2) by the system mailing facilities. U2 received file is first stored in a buffer (Reader) assigned to (U2) in his machine. (U2) may access said file and process it in several ways : display it, drop it or store it. In the latter case the file will be stored on a disk location assigned to (U2). Said disk location assigned to a user will be referred to as his (mini)disk A. As will be explained later on, the incoming mail may be filed in a named mail log, which nables classifying the disk A contents by subject matter as defined by the user. This is like storing in an assigned drawer. During the filing operation time stamping is performed which enables then sorting the mail log according to processing time. When using IBM CMS or PROFS software facilities, a command, designated by FILELIST, is called to sort the mail log contents and display it by last

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processing time. This command will be used by this invention to speed up and simplify the mail follow-up operations.

The follow-up system will be provided by providing each user with additional software facilities as disclosed further.

Obviously, the mail to be followed-up should neither be the dropped mail, nor the mail still buffered in the reader. This is the reason why mail tracking for the purpose of this invention will occur on data transferred from the reader buffer to storage disk A, or to a central storage. Also tracking may be made on any type of received (or sent) files, or as preferred here, on selected types of files, i.e. on VM files and so-called PROFS Notes and Documents.

Figure 3 a schematic representation of the follow-up organization used to handle the incoming mail. As represented in the figure, the selected mail items (i.e. VM files and PROFS Notes and Documents for present implementation) are being monitored while being transferred from the user's machine reader (buffer) to the user assigned memory zone referred to as the disk "A". Needless to repeat that this invention may be extended to other types of files without departing from the scope of this invention as disclosed in the following description.

The system to be described hereunder, automatically assigns a tag to each one of the selected files transferred from the reader. These first tags are being filed in a first storage means or "Mail To Be Assigned" file. From there mail tags could be processed by the user and then transferred into a "Mail To Be Answered" file. The mail to be answered may be processed either by the user or assigned to another user made responsible by a designated Administrator. As will be shown in more details further, the Administrator may administrate several users and process a machine made common to a group of users. For instance, the Administrator is made available a special memory section within his/her machine, memory section he/she may access on a read/write (R/W) basis while the remaining users within the group are given access (linked) to the Administrator memory on a Read only (R/O) basis. Also the Administrator may be assigned the job of installing the user's programs for the Follow-up system, arranging the group of users (listed in a table) into sub-groups, setting working parameters such as secretary assignments or operating "thresholds" (to be defined later). Subsequently, answered mail tags, or portions thereof, are transferred into a "Mail Answered" file and from there into user's file (Notelog, Mailog, etc...), and/or to a group secretary machine for monitoring and group history purposes to be reported to a group manager. In other words, the system may not only operate on stand alone basis, i.e. each user's mail being individually monitored and followed-on but also operate on group basis, and thus provide additional group processing functions. Needless to mention that administrator, secretary and manager may also be considered as simple users of the mail follow-up system. Also administrator, secretary and manager's control are optional.

A simplified mail follow-up flow is represented in Figure 4. The PF'S references designate terminal keyboard functional keys the user may depress to switch from one display (or task) to another.

Represented hereunder is a sample of tag assigned to a received mail by the system.

```
-------------------------------------------------------------
DOC NBR : 86157LAG0200   RCV DATE : 86 06 05    FROM : MILLE C.
SUBJECT : MEETING                               TGT DATE : YY MM DD
-------------------------------------------------------------

     - DOC NBR      86157  xxx  0192
                      !     !     !
                      !     !     !-- SEQUENCE NUMBER
                      !     !
               YEAR DAY-    !
              ( YY DDD )    !
                            !-- xxx User mnemonic determined
                                   by group administrator,
                                   of PROFS identifier
```

The above represented tag is made to include selected items or characteristic data for identifying the mail and performing adequate mail processing. For instance, the tag includes :

- Document Number : made with a year and day reference (e.g. 86157 standing for the 157th day of year 86); a user mnemonic either identifying the user, or identifying the system serving said user; and finally a sequence number e.g. 0192 to be explicited further.

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NB. When using IBM PROFS system the document number is already available in the requested form.
- RCV DATE : date the mail was received.
- FROM : identifies the sender
- SUBJECT : indicates the subject may : be provided automatically by the system in view of information entered by the sender while preparing his mail.
- TGT DATE is the target date for answer. Originally this tag field will indicate YY MM DD showing that year, month and day are reserved two digits each, and in that order. The user will file these fields in.

As apparent from the above definitions, some of the data are derived from the mail itself others are generated by the follow-up system.

All the above fields will be made alterable except Document Number and Receive Date.

Also, from a practical standpoint, as will become more noticeable further, specific highlightings or coloring are used to enable discriminating between alterable and non-alterable fields.

Shown in Figure 5 is a flow chart illustrating how the system is started. As represented, the mail follow-up may be initiated either automatically by inserting in the user's Profile Exec an instruction (EXEC MAILFRST) branching to the follow-up routine initiation automatically after the user logging on to his VM system-application; or on request from the user typing a specified command (MAILROUT) in CMS mode. To avoid time wasting, automatic display of tags and automatic access to the follow-up processing is limited to a preselected frequency, e.g. once a day. This is the reason why at each user log-off or exit from follow-up, the date and time is stored into a general counter ($GENCTR$ $FLUPma$ = file stored in the user's assigned memory as any other file). Should the current date be equal to the general counter stored date th routine would go back to PROFILE EXEC and proceed executing this program or in other words, leav the mail follow-up application. Otherwise, the routine would go to MAILROUT and execute main router of the program.

Consequently the system needs providing means for detecting received (or transmitted) mail between two consecutive follow-up sessions. In order to reduce the search time, only the files that have been updated since the last session are scanned. For this purpose, the program uses the FILELIST command which sorts the user's stored files by updating dates. Since file "$GENCTR$ $FLUPma$" is the last updated file, said file will be on top of the Filelist at log-off. Thus upon receiving or transmitting mail, the corresponding mail logs would sit on top of the "$GENCTR$ $FLUPma$" in the Filelist. Then at next Follow-up program run, the system needs only scanning those logs on top of "$GENCTR$ $FLUPma$". This is illustrated in Figure 6. Figure 6a shows a display of the Filelist at the end of a first follow-up session. It includes several logs named "TOTO NETLOG", "NOTE OFSLOGfl", "NOTEBOOK ALL" and "$GENCTR$ $FLUPma$" respectively, with "$GENCTR$ $FLUPma$" sitting on top of the Filelist. Then, assuming the network is being operated and mail stored first in Log "NOTEBOOK ALL", then in Log "TOTO NETLOG", without the Follow-up program being run, the considered logs would appear in the Filelist as represented in Figure 6b. Should Follow-up program be run either automatically (the next day), or upon the user's request (by typing a command "MAILROUT" from a terminal keyboard), then the Filelist would end as represented in Figure 6c, i.e. back with "$GENCTR$ $FLUPma$" on top of the Filelist.

Represented in Figure 7 is the flow chart for the main router program (MAILROUT EXEC) which will call successively three main routines :
- MAIL RECP which attaches tags to new incoming mail.
- MAIL ASSG which manages a "To Be Assigned" panel.
- MAILANSW which manages a "To Be Answered" panel.

Each tag attached to a mail file is assigned a reference number (see DOC NBR in Figure 4) which should be unique. The uniqueness is more particularly important when operating in group mode as will be disclosed later on. The document number format is as follows : YYDDDMNESSSS,
where YY = year; DDD = day of the year; MNE = 3 digit Mnemonic and SSSS = sequence number.

For stand alone mode, the default mnemonics are :
MNE = VMF for VM file.
MNE = VMN for VM note.
MNE = PFN for PROFS note.
MNE = PFD for PROFS document.

The last sequence number is maintained in a file, or tag counter "$SCNTR$$ $FLUPma$". In order to keep the uniqueness of the document number, one cannot afford to lose this sequence number. Therefore, if this file is accidentally eras d a recovery procedure is entered in order to reconstruct the file with the last sequence number. (A similar procedure (CALL MAILINIT) is also initiated at first use by a new end user being attached to the follow-up system).

The above operations on MAILROUT are represented in the flow-chart of Figure 7 wherein the system

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starts with checking for the existence of tag counter file $$CNTR$$ $FLUPma$. Should this counter be absent, call MAILINIT routine is being entered in, to recover the tag counter if it has been lost, or set up first tim use otherwise; and then return back to MAILROUT EXEC. The routin MAILINIT (see Figure 8) is called when the tag counter does not exist, ither to recover it if it has been accidentally lost or to update all the existing files at first time use of the follow-up system.

The tag counter is first set to zero. Then the system scans all stored files (VM files, VM notes, PROFS documents and PROFS note files) to detect any existing mailrout flag (see Figure 11). The tag counter is then updated to the highest detected flag value. The tag counter contents is tested. If the tag counter contents is zero, all stored files are flagged to simplify any subsequent flag test but no tag is created and the tag counter is updated prior to branching back to MAILROUT EXEC. Should on the contrary, the tag counter be different from zero, MAILINIT routine would then return to MAILROUT EXEC directly.

MAILROUT EXEC then branches to operating steps for a system involving a preassigned Administrator AND/OR Secretary processing for group follow-up management. For that purpose, a common disk mode of operation has been defined. The system gets therefrom parameters such as thresholds (to be defined) from a pre-stored Administrator table; references (node and userid) of the secretary assigned to the considered user, as well as references of the secretary assigned to same user at previous Mailrout run, to check for any secretarial reassignment. Should the secretary reference have changed, then a secretary back-up procedure (MAILSCBK) is initiated.

This back-up procedure is illustrated in the flow chart of Figure 9. The MAILSCBK EXEC starts checking flags assigned to the tags to discriminate between personal files whose tags have been assigned a personal "P" flag by the mail destination user, from tags being assigned an "S" (secretary"). S flags are assigned by default. Then those "S" flagged mail (in other words Public Tagged mail) to be answered, are monitored. If a secretary change occurred, the previous secretary as well as newly assigned secretary are notified.

The routine branches then, back the MAILROUT EXEC to process the receiving mail routine, i.e. call MAILRECP routine, of figure 10. The monitored received mail may include delegation tags, i.e. tags assigned by the follow-up administrator based on delegation criteria to be explained further. These tags need only be filed. The remaining files are scanned for all files belonging to the types to be considered (i.e. in VM or PROFS) and above the general counter in the FILELIST. This precaution enables limiting the mail processing to newly received mail. Each newly received mail (not flagged as will be explained later) is being prepared a tag by a repetitive routine which ends either with the last file received or to be processed through the delegation procedure. The process scans for last file. As long as last file is not processed, the last sequence number is fetched in the tag counter and incremented by 1 to generate the SSSS tag number reference. Then the new flag is constructed by getting the information from the processed file, i.e. originator name (FROM); subject; originating date (RCV date) and originator references (nodeid and userid). The mail originator is checked to generate and attach either an "S" flag for sent mail or "R" flag for received mail, in an unused part of the considered file.

Figure 11 illustrates the above flagging operation as applied to VM Notes. VM Notes are received (stored) in files whose file type is "Notebook". When displayed on the terminal each Note is separated from next one by separators (= = =) inserted by the system. The above mentioned sequence number is inserted on the separators line. As represented, Note 1 and Note 2 have been already processed and they have respectively been assigned sequence numbers 0732R and 0733R. Note 3 has been received since the last mail follow-up session and is not yet processed on Figure 11a. $$CNTR$$ $FLUPma$ contains the highest sequence number 0733. Once Note 3 is processed (Figure 11b) it is assigned sequence number 0734 and flagged with 0734R. The corresponding tag is added to the "To Be Assigned" file. The sequence counter is incremented to 0734.

In other words, MAILRECP EXEC performs the following operations:

(1) Scan the files wherein the sent/received mail is logged, i.e. belonging to one of the following types:

"xxxxxx NOTEBOOK" for the VM Notes.

"xxxxxx OFSLOGfl" for the PROFS Notes.

"xxxxxx NETLOG" for the VM Files.

"OFSINDEX OFSDATA" for the PROFS Documents.

(2) If new received/sent mail is detected (no flagged) a tag is constructed with the pertinent information gathered from said files;

(3) A flag (made of the sequence number followed by an S for sent mail or an R for received mail) is inserted in an unused field of the considered file (see Figure 10);

(4) The last sequence number in "$$CNTR$$ $FLUPma$" is updated.

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(5) The tag is put in the "To Be Assigned" file.

To minimize processing time for flag setting and follow-up operation from one follow-up session to the next, only those Log files which have been updated, i.e. have received new mail, are to be considered. For that purpose, the follow-up system takes advantage of th fact that the FILELIST command sorts the files by updated dates. Since the general counter file $GENCTR$ $FLUPma$ is the last updated file of the follow-up session, it should then stand on top of FILELIST. At next follow-up session, unprocessed files will sit on top of $GENCTR$ $FLUPma$. This enables the system identifying the only files to be considered, i.e. the files not already followed-up.

Therefore, the system identifies both the logs to be processed and within each log, the unprocessed files.

As shown in Figure 10 (including figures 10A, 10B and 10C), once last conventionally received mail has been assigned a tag, specially assigned mail (e.g. through delegation) will be tagged. Each file assigned a delegation flag is considered and if not already flagged, it is flagged. Finally, the system returns to MAILROUT EXEC to call for the "To Be Assigned" (MAILASSG EXEC).

Once the follow-up routine assigning the tags is run, the system automatically displays a "MAIL TO BE ASSIGNED" screen. Said screen displays several tags (5 in the hardcopy of screen represented hereunder). Each tag includes alterable fields (e.g. target date TGT) upon which the user may write, and non alterable fields (e.g. RCV date, or DOC NBR). Different colors have been used to discriminate between alterable and non alterable fields. Also, functional keys (PF Keys) have been customized to enable the operator processing the tags as well as the corresponding files. As will be apparent from subsequent description, the PF keys customizing may be organized at will by the programmer setting the various routines of the follow-up system.

```
   ************************************************************
*0 June 06, 1986    ** MAIL TO BE ASSIGNED **      Friday D157 W23 **
   ************************************************************
*1 DOC NBR: 86156LAG0192    RCV DATE: 86 06 06   FROM: MILLE C.       S
   SUBJECT: MEETING NOTICE                       TGT DATE: YY MM DD
   ------------------------------------------------------------------
*2                  MAIL 86147LAG0192 APPENDED                       S
                TO THE << TO-BE-ANSWERED >> FILE
   ------------------------------------------------------------------
*1 DOC NBR: 86156LAG0200    RCV DATE: 86 06 05   FROM: MILLE C.       S
   SUBJECT: MEETING                              TGT DATE: YY MM DD
   ------------------------------------------------------------------
*1 DOC NBR: 86157PFN0180    RCV DATE: 86 06 05   FROM: MILLE C.       S
   SUBJECT: CHECK POINT                          TGT DATE: YY MM DD   +
   ------------------------------------------------------------------
*3                       MAIL  86209CVZ0384                        * 5
                         MAIL TAG DISCARDED
   ------------------------------------------------------------------
*4 PF3=>QUIT PF4=>DELETE   PF6=>EDIT  PF7=>CREATE  PF9=>PRINT
   PF10=>FWRD   PF11=>BKWRD
```

Several characteristics of the system have been illustrated in the above screen hardcopy. They are identified with a flagged number to enable explaining them.

* 0 shows that the upper portion of the screen displays inter alia, the mail processing date as well as Day and Week annual reference numbers, e.g. D157 W 23 for 157th day and 23rd week of the year.

* 1 shows a mail tag for a document awaiting processing.

* 2 shows a mail tag when a target date has just been assigned and the corresponding tag transferr d into the "To Be Answered" file.

* 3 shows a mail tag just discarded by the user. As apparent from the PF designation, deletion is operated by pointing the cursor in on of the tag fields and depressing PF4 (or by forcing a "D" onto first "Y" of the TGT DATE).

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It should be noted, that only the mail tag is deleted not the associated mail. This feature enables clearing the tagged mail to keep only sel cted mail to be followed-up.

* 4 shows the PF keys designations. It is self-explanatory.

* 5 shows the secretary assigning flag. This flag is either set to S (by default) or to P. A tag with S goes to secretary for monitoring: A tag with P designates a private file not to be monitored by a secretary. "S" flagged tags will also be referred to as "public tags", from the secretary side.

The above operations are controlled by running the MAILASSG EXEC of Figure 12 (including figures 12A and 12B).

The tags are to be displayed on the screen by page (p) starting with p = 1. Once the tags are displayed, the user may select a tag or a selectable field within a tag using the cursor in a conventional manner, e.g. using the keyboard, tab control keys or the cursor control keys. This action is monitored by the system and considered as a "user response".

After each response, the tags are scanned and target date are checked for updating and for tags to be deleted. For target date including a numeral value (a D inserted as first data digit means delete), validity is checked. Invalid dates, e.g. MM > 12, trigger an error message, to get corrections from the user, when PF3 is depressed to QUIT. Once date validity is checked, the tag is transferred into the "To Be Answered" file and deleted from the "To Be Assigned" file.

The customized functional keys are scanned for testing depletion. Obviously the functional keys may be customized as required by the follow-up system users needs. For the presently achieved implementation of the Mail to Be Assigned routine, the PF keys have been assigned the following functions:

- PF4 = delete : to delete the tag from the "To Be Assigned" file.
- PF6 = call Mail Edit : branches to a routine fetching the document attached to the tag and displaying it.
- PF3 = quit : file the changes made by the user to each tag and switch the follow-up system to the "To Be Answered" routine. In other words, quits the To Be Assigned routine.
- PF7 = create : branches to a routine for creating tags at will. This routine displays a blank tag for adding tag reminders for any mail not received through the electronic mail monitored and tracked by the follow-up system.
- PF10 and PF11 : enable scrolling the "To Be Assigned" file, forward and backward respectively.

Upon depressing PF3 while MAILASSG EXEC is being run, the system branches to MAILANSW EXEC for processing mail to be answered (See Figures 13A-D, with 13C including C1 and C2).

By running MAILANSW EXEC the system first checks for notifications of new or changed delegation tags. In case of positive check, the system branches to MAILFWTR EXEC (see Figure 14) to present delegation tags. Delegation tags, are tags generated not on conventionally monitored received mail, but rather on jobs assigned through a delegation procedure, either by one of the average system users or by the administrator. These tags thus attach to transferred jobs. The MAILFWTR EXEC (Fig.14) presents the delegation tags that are new or updated. Those information are extracted from a follow-up file designated as "Tag Notification" file "$FWTRK$ $FLUPma$" created by the system and updated by MAILRECP EXEC. Going back to MAILANSW EXEC (Figure 13A) first the tags are sorted by target date and sequentially read out, and displayed with special highlighting based on predefined thresholds of delays with respect to the target dates. For instance :

1) If target date < 1st threshold :

FIELD1 = DOC NBR set blue.
FIELD2 = RCV DATE blue.
FIELD3 = TGT DATE green.
FIELD4 = ANSWR DATE green.

2) If 1st threshold < TGT DATE < 2nd threshold :

Same as above except that Field 2 content is made to include "" TARGET -X "" with X being the number of remaining days up to target. This field is colored white.

3) If TGT DATE ≥ 2nd threshold :

Same as (2) but with different colors :

FIELD1 = white.
FIELD2 = white.
FIELD3 = red.
FIELD4 = red.

Then tag checking versus first threshold starts. If first threshold is reached and the tag considered is not

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a private tag, the secretary is notified. These operations are performed down to last tag. For each file wherein the first threshold has been reached , a "T" flag (threshold flag) is loaded in a tag threshold flag field to trigger monitoring. The tags are displayed starting with page 1 of tags (see Figures 13B-13C). User may update (or not) any of the displayed tags. As represented in Figure 13C, (note that this figure has been split into 13C1 and 13C2), if the considered tag has been updated check if the ANSWER date starts with a "D" (for delete). If this is the case then, the tag is written in the "Has Been Answered" file to stop following that mail up. If the answer is negative (i.e. no "D" tag), a date validity check is operated. If the date is invalid a message is displayed, calling the user for correcting the date. PF3 is tested for depression. If not depressed, the date validity check proceeds to next tag, otherwise answer date is set to "YY MM DD". For a validly checked tag, the tag is written in the "Has Been Answered" file. Then come two consecutive tests. First test checks whether the user is responsible for the answering. If yes, then a delegation changes notifier routine (MAILFWTG EXEC) (see Figure 15) is called; otherwise publicity of tag is checked and if not public, the tag is simply deleted from the "To Be Answered" file. If the tag is public, then a notification tag is prepared for the secretary with a "D" flag for deleted tag or an "A" flag for answered. A check for possible delegation list attached to the considered flag is operated. If this is the case, a secretary delegation notification is prepared prior to the tag from "To Be Answered" file; otherwise deletion is operated right away. These operations are performed down to the last tag.

Assuming Answer Date was not updated, a check for target date change is performed. If not changed, tag scanning goes to next tag. If the target date has been changed, a check for target date validity is performed. If not valid, an error message is displayed inviting the user to enter a corrected date. Then, once PF3 is depressed target date is reset. If the target date was found valid, a check for target date lower than first threshold and threshold flag = "T", leads to flag set to F. Indeed, when first threshold is reached, for a public tag, a "T" flag is inserted in a threshold flag field. Said "T" enables signalling that the considered tag, entered a survey zone and the secretary was notified.

Then "check if target date < threshold AND threshold flag = "T"", means : should this test be positive, the tag entered the survey zone, the secretary was notified, but, the target date has been postponed to leave the survey zone. The secretary needs thus be notified with a "delayed" flag.

Therefore, in both instances where either the answer date was updated or the target date was changed the tag is being taken care of directly and then the system looks for any delegation order assigned to the considered tag (i.e. its associated file). For that purpose, the system branches to the delegation changes notifier routine (MAILFWTG EXEC) (see Figure 15).

To understand the rationale of this feature, some additional information may be useful. Whenever one of the follow-up system users receives a mail, he/she may decide to delegate the responsibility of the answer to another user within a predefined review list of users, along with designating one or more reviewers for comments. The delegation facility is accessible through PF8 (forward responsibility) in the Mail To Be Answered screen, as will be explained later on. Once the choices are set, they enter a delegation history file.

Consequently upon running MAILANSWR EXEC once the MAILFWTG routine is called, the syst m performs, the following operations (see Figure 15) :

- find and review list in delegation history file;
- construct a "delegation notification" file;
- send "delegation notification" file to the deleguees (responsible or reviewer).

As represented in Figure 15 counters may be used and loaded or incremented upon delegation processing for statistical and control/planning purposes.

MAILANSWR EXEC also provides customized functional keys distributed into two menus with PF2 switching from menu 1 to menu 2 and PF1 switching back to menu 1 (see Figure 13B). In both menus, depressing PF3 branches to a "quit" routine as will be explained later on with reference to Figure 13B. Functions of remaining keys are organized as follows :

(1) In Menu 1 :

- PF5 : calls MAILASSG EXEC and switches back to screen "Mail To Be Assigned".
- PF6 : calls a MAILEDIT routine enabling editing the file attached to the tag, which in practice is particularly useful. This routine just gets the mail text and displays it.
- PF7 : calls a MAILCREA EXEC for creating a tag (to be disclosed with reference to Figure 16). This is particularly useful to enter any telephone call or paper message data into the follow-up system. In other words for extending the Follow-up system to non-electronic mail.

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- PF8 : calls MAILFWRD EXEC (see Figure 17 including 17A and 17B), for presenting the delegation menu.

The delegation function was already mentioned in connection with MAILFWTG EXEC. More particularly, in present application, four delegation levels have been made available to the user :

(a) Addressee (A) ; he is really the addressee of the considered mail and may : input the target date; modify the Selection Flag; and assign Responsible and Reviewer(s).

(b) Responsible (B) : he is the person requested to provide the mail answer and inputting the answer date. He may designate a new responsible; alter the list of reviewers and modify the target date.

(c) Reviewer (C) : person(s) requested to review/comment the mail.

A delegation Flag (A, B, C or D) is automatically attached to the corresponding Tag. The delegation procedure will be described in details in connections with Figures 17.

- PF10 and 11 are used for scrolling "Mail To Be Answered" screen, forward and backward respectively.
- PF = calls a MAILMORI EXEC presenting a menu to add and view more information to the pointed tag.

(2) In Menu 2 :

- PF1 = switches back to menu 1.
- PF2 = calls a routine MAILSRCH EXEC for searching in the answered files.

Finally, in both Menu 1 and Menu 2, PF3 is a QUIT key. Depressing said key enables quitting the follow-up system after several operations are performed (see Figure 13D).

Upon quitting the follow-up, target dates relative to Answered or To Be Answered mail have first to be updated. This means computation and writing for display of any delay remaining for processing the mail attached to each flag. In parallel with these operations, any secretary assigned for monitoring, should be automatically advised.

First, if the tag was under secretary monitoring and has been changed to private, then the secretary is notified that the corresponding mail has been privated. Assuming the corresponding mail was with a threshold flag, said flag is accordingly erased.

Subsequent test is operated over delay flag to enable notifying the secretary that mail processing was delayed and reset the threshold flag.

The above operations are repeated over all tags in the "To Be Answered" file to enable then modifying the tags accordingly, sending the secretary notification files or erasing secretary notification files. The routine then branches back to MAILROUT EXEC to update the general counter with the current date and current secretary and erase the tag notification file and finally Quit the application. The "Mail To Be Answered" panel, finally looks as follows :

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```
**********************************************************************
June 06, 1986     ** MAIL TO BE ANSWERED **        Friday D157 W23 **
**********************************************************************
*1 DOC NBR: 86156LAG0206 ** TARGET+2 **TRGT: 86 06 04 ANSWR YY MM DD  S
   SUBJECT: MEETING NOTICE                              FROM: MOURIER Y.
----------------------------------------------------------------------
*2 DOC NBR: 86156LAG0251 ** TARGET+2 **TRGT: 86 06 01 ANSWR YY MM DD  S
   SUBJECT: CHECK POINT                                 FROM: MILLE C.
---------------------------------------------------------------------- * 3
   DOC NBR: 86119PFN0104 RCVD: 86 06 06TRGT: 86 06 01 ANSWR YY MM DD
   SUBJECT: MEETING                                     FROM: MILLE C.   S B
---------------------------------------------------------------------- * 4
                          MAIL 86147LAG0192
                               ANSWERED
----------------------------------------------------------------------
   DOC NBR: 86209VNZ0111 RCDV: 860605  TRGT: 86 06 01 ANSWR YY MM DD
   SUBJECT: ACTIVITY PLANNING                           FROM: MILLE C.   P C
---------------------------------------------------------------------- ↓ ↓

                                                                      *5
                                                                        *6
----------------------------------------------------------------------
PF2=>MEN2 PF3=>QUIT PF4=>DELETE PF5=>TBASS PF6=>EDIT PF7=>CREATE
PF8=>FWDRSP PF9=>PRINT PF10=>FWRD PF11=>BKWRD PF12=>MORINF Page 1 of 1
```

The indexes *1 through *6 are only used here to point out and explain the specific features offered by the considered routines.

*1 shows an highlighted overdue target (+2 meaning : 2 days past the target as might be checked by comparing the current date appearing in the upper left hand corner of the screen, to the TRGT of first tag).

*2 the highlighting emphasizes a reached threshold (5 days before target), calling that tag to user's attention. Will be decremented each day.

*3 mail not answered, and threshold not reached yet.

*4 answered mail. Answer date just entered into the system.

*5 mail assigned a personal selection flag (not reported to secretary).

*6 delegation flag.

As represented in Figure 13B, depressing PF7 in menu 1 calls MAILCREA EXEC (see flow chart of Figure 16).

This routine enables taking advantage of the follow-up system even for non-electronic mail, e.g. paper mail, telephone calls, personal activities and reports etc... by entering a tag from the keyboard. For that purpose, calling MAILCREA EXEC displays a tag template with already filled-in fields and fields to be filled-in, as shown in the hardcopy of screen represented hereunder.

BNSDOCID: <EP___0346556A1_I_>

```
**********************
*  ACTIVITY/MAIL     *
*  TAG  CREATION     *
**********************

-------------------------------------------------------------
DOC NBR: 86061TUB1756 RCVD: 88 03 01          FROM: TUBIANA
SUBJECT: External document creation           TGT DATE: YY MM DD S
-------------------------------------------------------------
          FILL IN THE REQUIRED FIELDS THEN ENTER TO CONTINUE

                  If the Target date is filled in:
              the tag will show on the TO-BE-ANSWERED screen
                              It not:
              the tag will show on the TO-BE-ASSIGNED screen
-------------------------------------------------------------
PF3==> QUIT
```

The already filled-in fields include a DOC NBR set by the sequential counter and predesigned for the user. For instance 88061TUB1756 standing for the 61st day of 1288 (current date), TUB for the user's ID mnemonics and 1756 as sequence number. Also, filled-in field includes the current date as RCV DATE. None of these could be modified. The originator field (FROM) comes filled in with the user's name but is alterable at will from the keyboard. The SUBJECT field is made to include a message e.g. "External document creation" inviting the user to enter a subject. As per the TGT DATE it first includes YY MM DD. If the target date is filled in, the tag will show on the "To Be Answered" screen; otherwise the tag will show on the "To Be Assigned" screen. Obviously, features like "EDIT" for editing the corresponding mail will not be available in this case.

As represented in Figure 16, the routine involves first getting the last sequence number in the Tag Counter, incrementing it by one to get the Tag current sequence number (e.g. 1756). Then "Mail Create Screen" is presented on the terminal display. The system reads the user's field modifications, then checks the TGT DATE contents to decide on filing the tag either in the "To Be Assigned" file, or in the "To Be Answered" file depending whether the TGT DATE field has been filled-in or not. A date validity check has also been provided enabling correcting any date error prior to quitting MAILCREA EXEC and branching back to MAILASSG EXEC.

As already mentioned, while running MAILANSW EXEC depressing PF8 calls MAILFWRD (see Figures 17A-B) to present and process the delegation menu. The user gets on the screen a table including the names, userids and nodeids of the persons belonging to the group commonly served and administrated. said group may have been divided into subgroups (with a reference number 0, 1, 2, etc...). Said displayed table also includes a flag "F" field wherein the user may write B for responsible; C for reviewer or D for deleted. By entering one of these letters as a flag in front of one of the persons in the table, delegation or deletion of delegation is operated.

Also, by answering a question by Yes or No (NO being set by default), one may attach the document to the delegation tag. Attach, meaning here provide the deleguee with means for getting the full text mail considered, or in other words, transferring both the tag and the tagged mail (or means for accessing said mail).

In other words, a notify counter is first read and incremented and a delegation notification file prepared. A test is made to check whether the user is responsible (tag status neither C nor A) and therefore can delegate the job of answering the considered mail. If he/she is not responsible, then the system issues a message and branches back to MAILANSW EXEC. Otherwise the entries from the administrator table are read and the considered userid looked for. Should the userid exist, then a delegation history file is scanned to determine whether delegation tag already exists. The administration table is presented with highlighted already existing entries (e.g. DOC NBR, addressee name and userid).

The user's typed choice is read and checked. Should more than one responsible deleguee be set, then only the first one on the list is maintained and the others are assigned reviewer job. Then, assuming the user himself be a "responsible" deleguee, while responsibility is also assigned to another member of the group, then the user's status is converted to addressee.

Depressing PF3 enables quitting delegation menu or depressing PF5 confirms the delegation choic s

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made and switches back to presenting "MAIL TO BE ANSWERED" Panel to the user.

From that moment on, the addressee sees his status (A or B) in his/her document mail tag, indicating that the delegation process has been used. A tag is sent to the "Mail To Be Answered" log of the Responsible and possible Reviewers, consequently flagged with the appropriate letter (B or C).

If the addressee only assigns Reviewers (C), keeping responsibility for the answer, his/her flag is automatically changed from A to B.

The associated document must be separately forwarded to the person(s) involved as Responsible or Reviewer(s). A $FLPxxxx file containing the delegation information is forwarded to the involved users. No user action is required the follow-up program will read it automatically when invoked. The addressee and Reviewers' tag will automatically be processed when the Responsible enters the answer date.

As mentioned in connection with Figure 13B, depressing the PF12 key enters a MORINFO routine (MAILMORI EXEC) to present a screen named "More Info For Document NBR X" wherein X is the reference number for the document being processed. This displays information, considered as mail characteristics, such as:

- Subject
- Origin
- Date document received
- Target date
- Document type
- Where found (e.g. name of Notelog or Notebook)
- Delegation status

If delegation function has been used, the name of all involved addressee(s), Responsible and Reviewer-(s) are displayed along with the dates.

Addresses are sequentially numbered in case of multiple transfers during the delegation process. In any case, a unique individual is responsible to provide the answer. The MORINFO flow chart is shown in Figure 18. The mail characteristics are first fetched out of the mail. Then a checking on delegation situation is operated using the delegation list. this enables giving a warning message for any incompatibility barring adding information to a considered tag. Otherwise, the mail characteristics are displayed together with a pointed at zone for entering information one wishes to add to the considered tag, and then return to displaying the "Mail To Be Answered" panel.

As represented in Figure 13B, depressing the functional key PF2 while operating in menu 2 calls a MAILSRCH routing for search among answered mail. Obviously this function is an added one which emphasizes the interest of the follow-up system by showing how functions may be added. This routine enables searching among answered mail. It displays a set of fields interconnected with logic expressions AND/OR. By simply typing keywords in said fields, the user may define the query operation to be activat d for searching. The system then displays the corresponding detected mail tags upon which operations such as displaying more information or reactivating a selected tag may be performed.

Represented in Figure 19 (including 19A and B), is the MAILSRCH EXEC. When run, this program module scans the history file tags and checks for availability to the requester. Then, the system will get and sort the answered file tags by answer date and then present a search panel for entering dates and search arguments. Depressing PF3 exits from MAILSRCH and back to MAILANSW EXEC. Otherwise the system checks for match between the tags answer date and the searching date limits set. Then searching is operated based on the logical search argument and present the result tags and the results are displayed.

Functional keys customization are self explanatory, e.g. PF2 calls for the MAILMORI EXEC.

As already mentioned, the mail processed by a follow-up user may also be tracked by an assigned secretary. For that purpose, in addition to the files (buffers) available to any conventional user as disclosed above, the secretary's machine is assigned a "Notification File", a "Monitoring File", a "Delegation Notification File", and an "Answered Delegation File". The secretary follows the mail tags that have passed the threshold limit and reviews them with the manager to develop an action plan to have the document answered in due time.

The secretary may record statistical data to be presented to management. Tracking capabilities may be defined by : number of received documents (mail), number of assigned documents; number of answered documents (in/out target) and number of deleted documents.

This is made possible by modifying the secretary's PROFILE EXEC to include a MAILSECF EXEC to be executed at LOGON time or upon typing "MAILMONI" command in CMS Mode.

The above process is represented in flowchart of Figure 20. When reaching the exec MAILSECF instruction inserted into the secretary's Profile Exec, the system fetches the contents of a secretary counter loaded with the date of each session. Should said date be the current date, then the system branches back

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to Profile Exec and proceeds on. Otherwise it branches to the MAILMONI routine of Figure 21.

The "Secretary Monitoring" file is evolutive along the day : e.g. a tag that has a status of "TARGET-1" will have a status of "Answered" when the us r has assigned an answered date. At 1rst Logon of the day all the tags that have been processed during the previous day (answered, deleted, privated, delayed) are purged from the monitor in file through MAILSPRG routine.

According to this routine the system reads the secretary counter containing the date of previous session, and compares it with current date. Should they match, the system branches to MAILSPRG routine to update the entries (see Figure 22). It reads all the entries of the Secretary Monitoring File containing the monitored mail and erase all entries which are not flagged "T" i.e. which did not reach the first threshold set for answering the corresponding mail.

The routine branches then back to MAILMONI EXEC and checks if Secretary Notification Files have been received in the secretary machine reader (entering buffer) and file them. The system then gets the Secretary Notification File and uses this file contents to update the Secretary Monitoring File accordingly.

The system then checks whether the status of any mail is NOT F (for delayed) or P (for privated). Should the answer be positive, all secretary's files need be updated starting with the Secretary Answered File; then erasing the Secretary Notification File; getting the Delegation Notification File; deleting the previous Delegation list in the Answered Delegation File; adding the New Delegation List to the Answered Delegation File; and erasing the Delegation Notification File; prior to branching back to the Secretary Notification File for scanning up to last Secretary Notification File.

When last file is checked, the MAILMONI EXEC branches to the routine MAILSCDS EXEC (see fig. 23) controlling the secretary Monitoring display as represented hereunder.

```
                                                              Status
                                                                ↓
**************************************************************************
June 06, 1986   **    MAIL MONITORING    **    Friday D157 W23  **
**************************************************************************
Bartin Franck DOC NBR : 86157LAG0192    TRGT: 86 06 06   ** ANSWERED *
SUBJECT: MEETING NOTICE                              FROM: MILLE C.
--------------------------------------------------------------------------
Cavelier JP   DOC NBR : 86157LAG0200    TRGT: 86 06 11   ** TARGET-5 *
SUBJECT: MEETING                                     FROM: MILLE C.
--------------------------------------------------------------------------
Mille Claude  DOC NBR : 86157PFN0180    TRGT: 86 06 08   ** TARGET-2 *
SUBJECT: CHECK POINT                                 FROM: MILLE C.
--------------------------------------------------------------------------
Mulot P.      DOC NBR : 86157PFN195     TRGT: 86 06 05   ** TARGET+1 *
SUBJECT: CHECK POINT                                 FROM: MILLE C.
--------------------------------------------------------------------------
 PF3==> QUIT    PF6==> FORCE ANSWER   PF7==> FORCE DELETE
 PF9==> PRINT   PF10==> FWRD   PF11==> BKWRD
```

MAILSCDS EXEC starts with getting the Secretary Monitoring File entries and setting up the appropriate files statuses. Selected types of statuses are :

"A" = ANSWERED = An answer date has been entered by user.
"D" = DELETED = The document tag has been deleted.
"P" = PRIVATED = The user has modified the selection flag from S to P.
"F" = DELAYED = The user has modified the target date.
TARGET-XX = XX represents the delay to threshold date.

This status is made to call the corresponding mail to the secretary's attention by indicating that the current date is within the threshold (set under local administrative decision).

As represented in the Mail Monitoring display, functional keys have been customized. Some functions like QUITE; PRINT; FWRD (for forward) and BKWRD (for backward) are self explanatory. PF6 = FORCE ANSWER and PF7 = FORCE DELETE have been added. PF6 to overcome any accidental discrepancies between user's and secretary's tags which normally should automatically match, by updating the Secretary Monitoring File when the corresponding mail is transferred to the user's Answered file. PF7 to overcome any discrepancy's regarding deleted tags.

In conclusion, the follow-up system not only enables automatically generating predesigned mail tags,

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filling these tags with data fetched out of exchanged mail, displaying and processing the mail tags and/or corresponding mail, but it also enables performing various administrative operations. These operations may go from simple secretarial monitoring, to more complex mail processing on a group basis including under administrator's control.

Claims

1. An electronic mail follow-up system for a data processing and transmission digital network, wherein users have been individually assigned a virtual machine including, in a network node, a memory zone and means for sharing software and hardware facilities for entering, processing and mailing data to one another through any keyboard/display terminal attached to said network once logged-on to the system, said system including for each assigned user :
means for generating mail tags including predefined fields;
means for tracking user's mail and fetching or deriving therefrom predefined characteristic mail data;
means sensitive to said tracking means for recording said mail data into corresponding predefined mail tag fields whereby filled in tags are generated;
means responsive to said means for recording, for storing said filled-in tags in a first predefined file, or Mail-To-Be-Assigned file, into said user's machine;
terminal controllable means for displaying said file contents onto the user's terminal display; and
terminal controllable means for accessing and processing the displayed mail tags including :
means for sensing specific mail tag fields;
means responsive to said sensing means for analyzing said sensed fields content; and
means responsive to said analysis for transferring mail tags into a second file or "Mail-To-Be-Answered" file.

2. An electronic mail follow-up system according to claim 1 wherein said mail tracking means include :
a buffer means wherein incoming mail is being buffered;
terminal controllable means for selectively transferring said buffered mail into user's designated storage logs within said user's virtual machine memory;
means responsive to said selective transferring means for tracking said mail being stored and fetching the predetermined characteristic data therefrom.

3. An electronic mail follow-up system according to claim 2 wherein said means for tracking the mail further include :
time reference generating means;
a general counter file for automatically storing therein said time reference;
means for automatically storing said general counter contents into a preassigned user's virtual machine memory location upon the user's machine log-off operation; and
means for comparing said stored time reference with current time, and for initiating the subsequent mail follow-up system operation based on said compare result.

4. An electronic mail follow-up system according to claim 3 wherein said automatically stored time reference is the last date and time the follow-up system is activated, whereby subsequent activation is based on said compare showing a difference in date.

5. An electronic mail follow-up system according to claim 4, wherein said software facilities include :
means for sorting the user's memory stored files by inverse chronological updating order;
means for stacking said sorted files into a filelist file; and
means within said means for tracking stored mail including means for scanning only the mail files stored on top of said general counter file within said filelist.

6. An electronic mail follow-up system according to claim 5, and including :
a sequence number counter;
means, sensitive to said counter contents, for incrementing said sequence number counter contents at each new followed mail;
means for generating for each followed mail a document number reference including the corresponding sequence counter contents; and
means for inserting said document number into a preassigned tag field.

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7. An electronic mail follow-up system according to claim 6 and including :
means for generating a mail flag including the corresponding sequence number; and
means for attaching said flag to the mail in a preassigned log location;
whereby, upon any accidental loss of the sequence number counter contents, said counter is reloaded using the highest flag number fetched from said log locations.

8. An electronic mail follow-up system according to any one claims 1 through 7 further including :
means for displaying said "Mail To Be Assigned" file tags; and
terminal keyboard controlled means connected to said display means for selecting and filling predetermined tag fields.

9. An electronic mail follow-up system according to claim 8 further including :
means for sensing said tags target date field contents;
testing means responsive to said sensing means for testing said sensed target date; and
means responsive to said testing means for transferring validly checked target date tags into the "Mail-To-Be-Answered" file.

10. An electronic mail follow-up system according to claim 9 and including keyboard controlled means for deleting tags from any tags file.

11. An electronic mail follow-up system according to claim 10 further including key operated means for selecting and processing mail tags.

12. An electronic mail follow-up system according to claim 11 and including :
means for generating and storing current date;
means for setting date thresholds relative to target dates;
means connected to said date storing means and to said threshold setting means for generating alerting messages to the user upon said date thresholds being reached;
means responsive to said message generating means for storing said messages into preassigned fields of corresponding mail tags within the "Mail-to-be-Answered" file.

13. An electronic mail follow-up system according to claim 12, further including :
administrator means for assigning a secretary machine for monitoring the mail of any user's machine;
means responsive to said administrator means for reporting answered mail to said secretary's machine; and
means responsive to said administrator means for reporting said alerting messages to the secretary machine.

14. An electronic mail follow-up system according to claim 13, further including :
user keyboard controllable means for inserting a private flag into a predetermined tag field;
means for detecting said private flag; and
means responsive to said means for detecting for barring reporting the corresponding tag to the secretary.

15. An electronic mail follow-up system according to claim 14 and including means for collective departmental mail processing including :
a table of users attached to said department;
keyboard controllable means for splitting said users into sub-groups, assigning a sub-group reference to each user in the table; and
keyboard controllable means for assigning a secretary to each sub-group by filling a predetermined table location with a sub-group reference data.

16. An electronic mail follow-up system according to claim 15 further including :
keyboard controlled means for entering a delegation flag into a table location assigned to any user;
means for reading said table delegation flag location and for forwarding the considered mail tag to the delegated user accordingly; and
means for informing the original user on any delegated user's action upon said tag.

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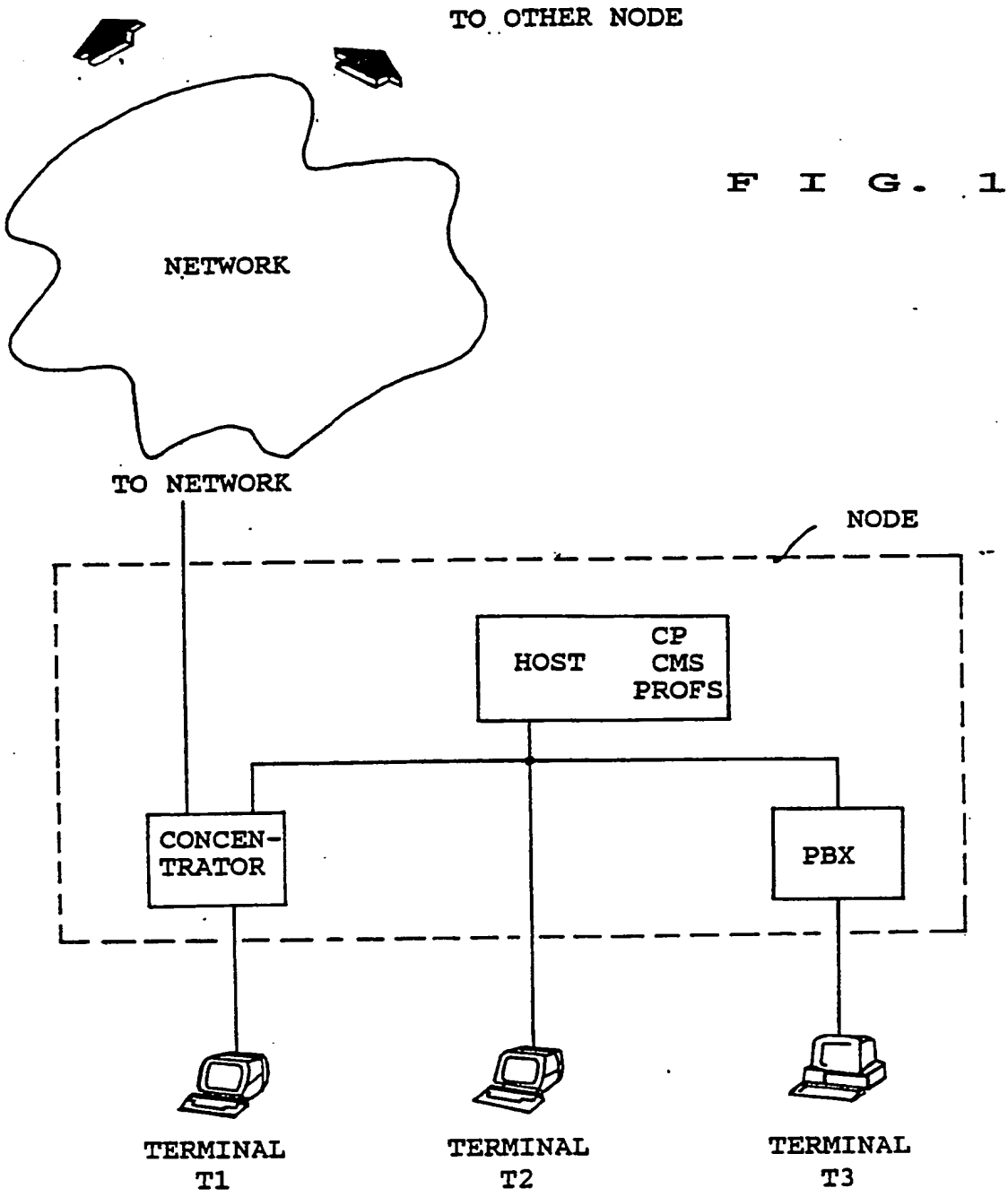

TO OTHER NODE
NETWORK
TO NETWORK
NODE
HOST
CP
CMS
PROFS
CONCEN-
TRATOR
PBX
TERMINAL
T1
TERMINAL
T2
TERMINAL
T3

F I G. 1

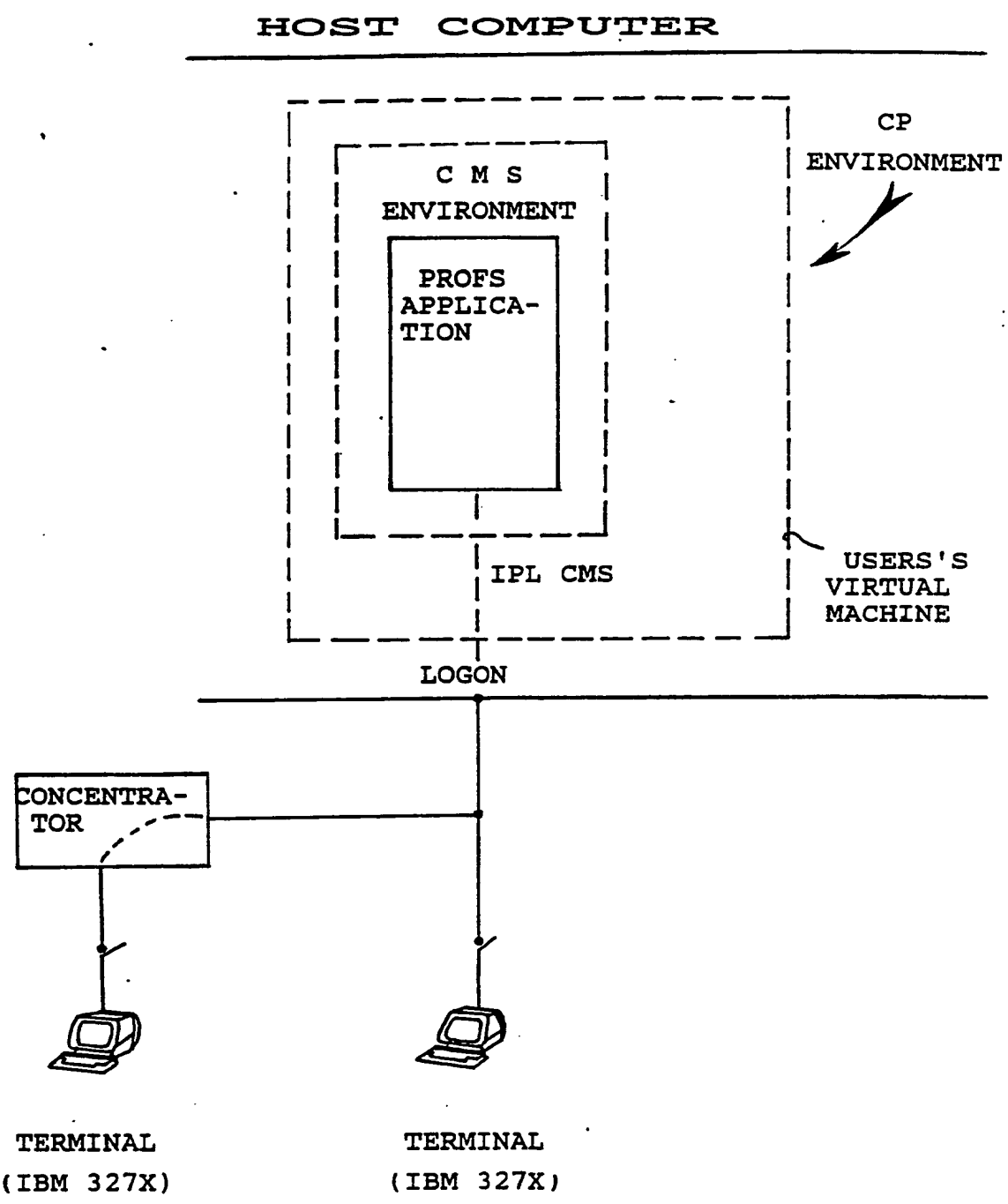
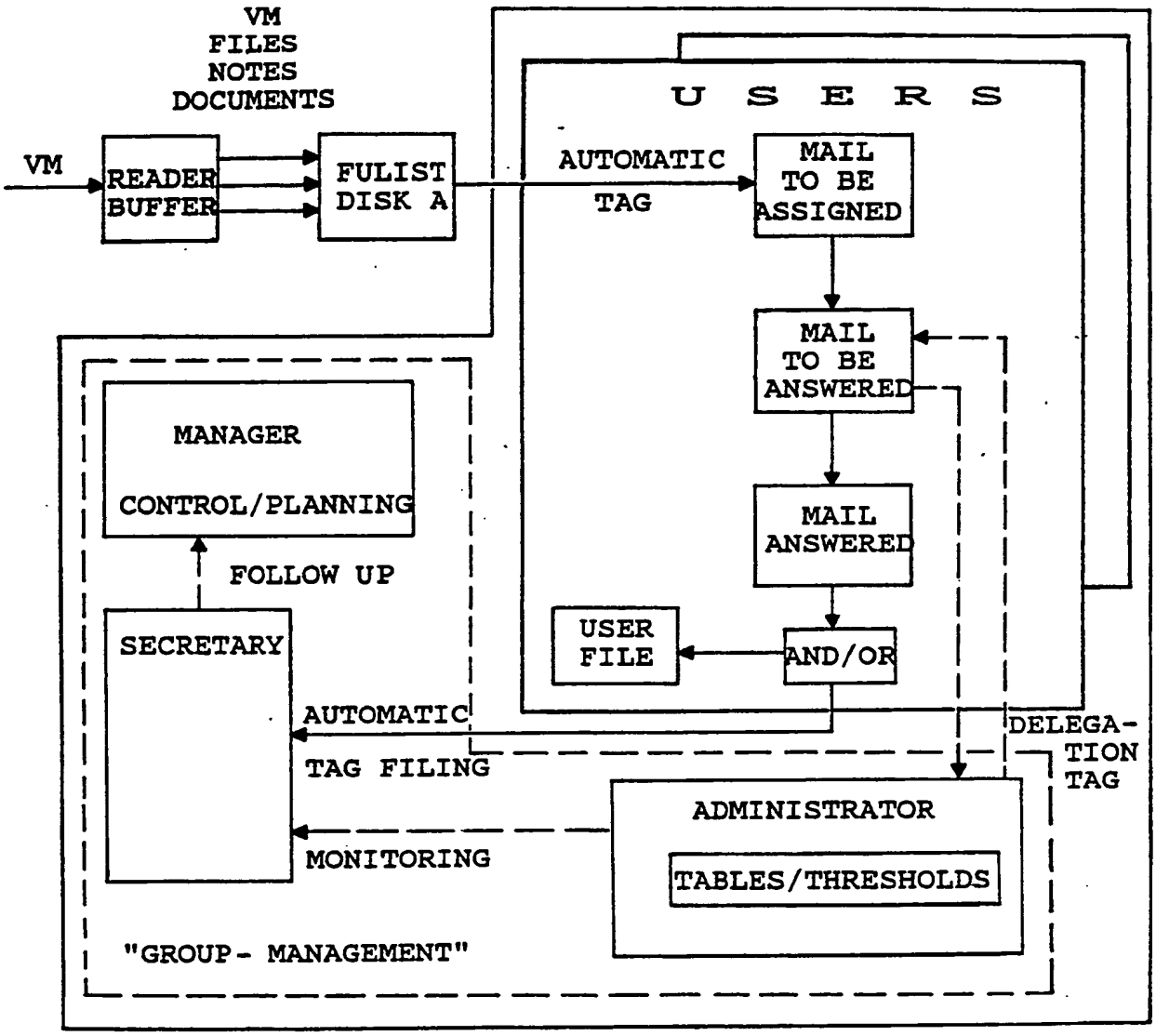

HOST COMPUTER
CP
ENVIRONMENT
C M S
ENVIRONMENT
PROFS
APPLICA-
TION
IPL CMS
USERS'S
VIRTUAL
MACHINE
LOGON
CONCENTRA-
TOR
TERMINAL
(IBM 327X)
TERMINAL
(IBM 327X)

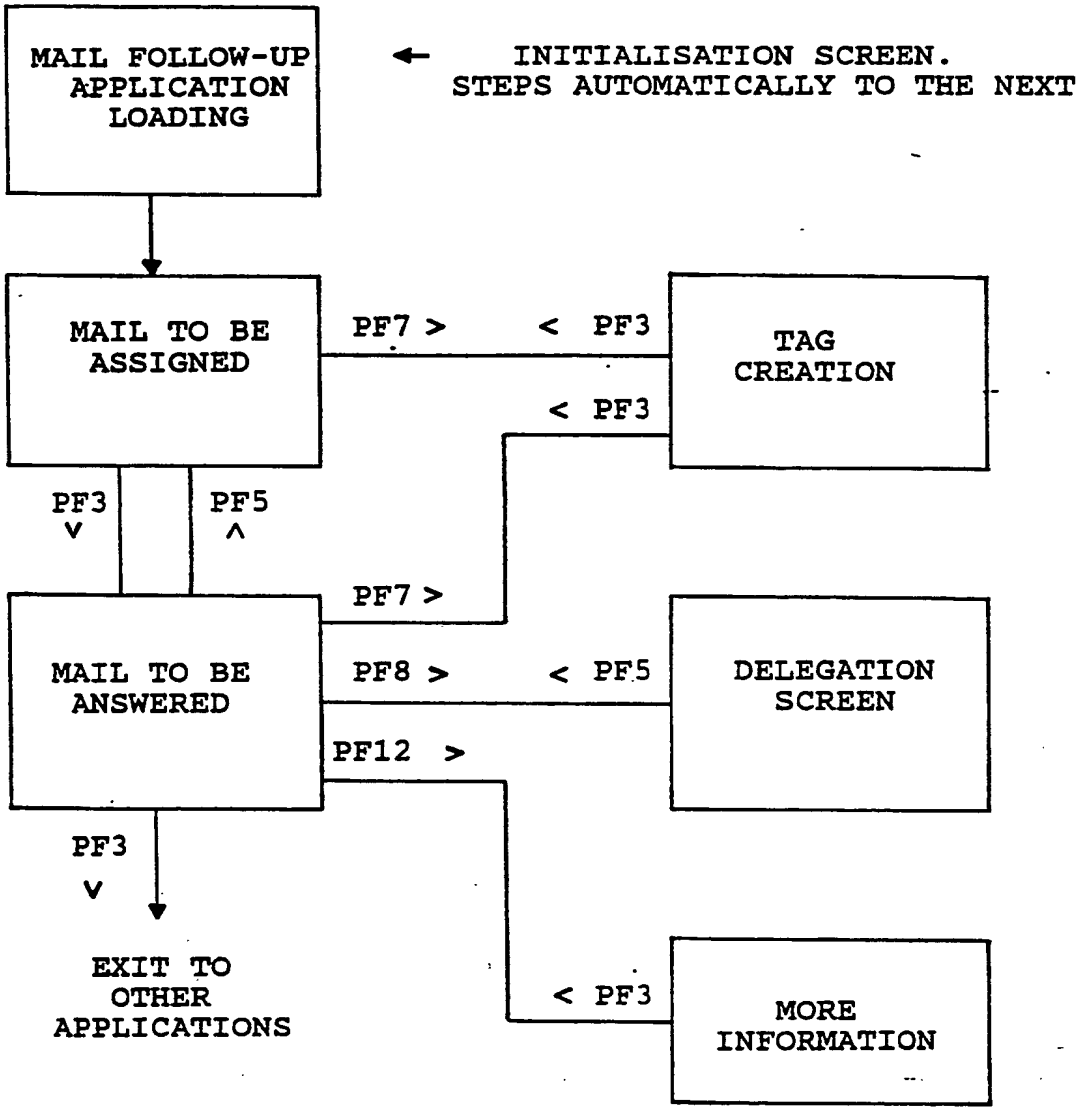
FIG. 2

FIG. 3

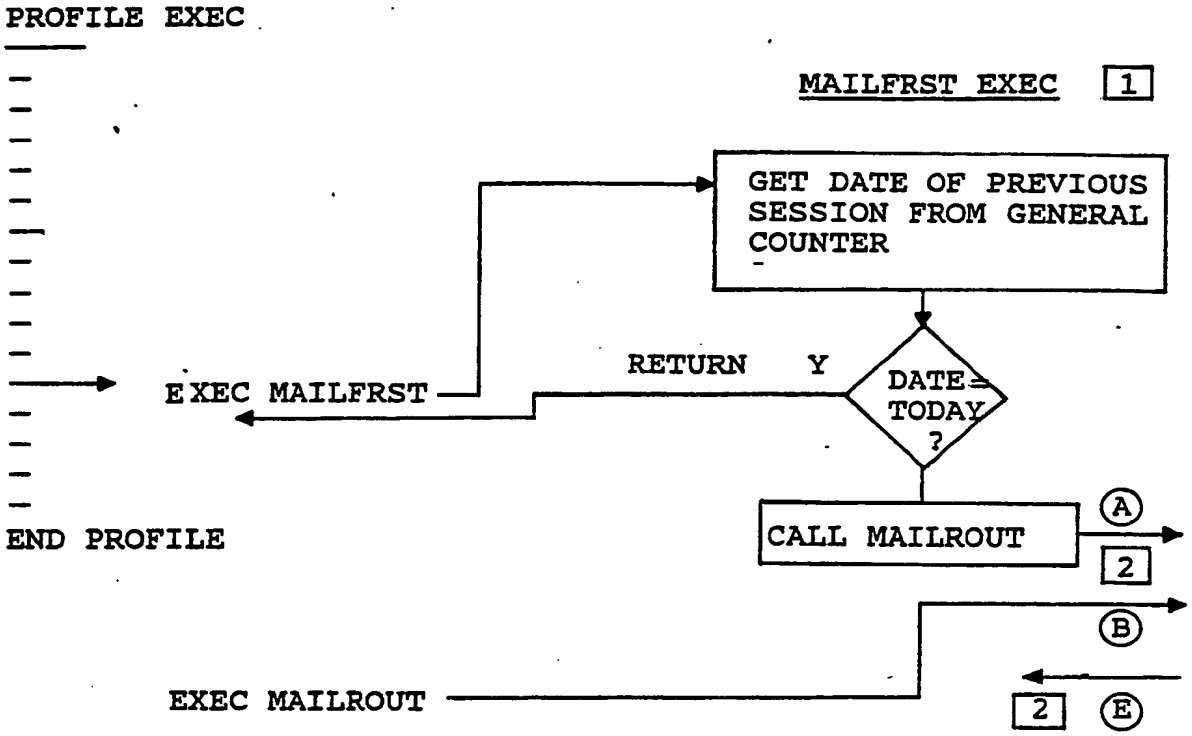


BNSDOCID: <EP__0346556A1_I_>

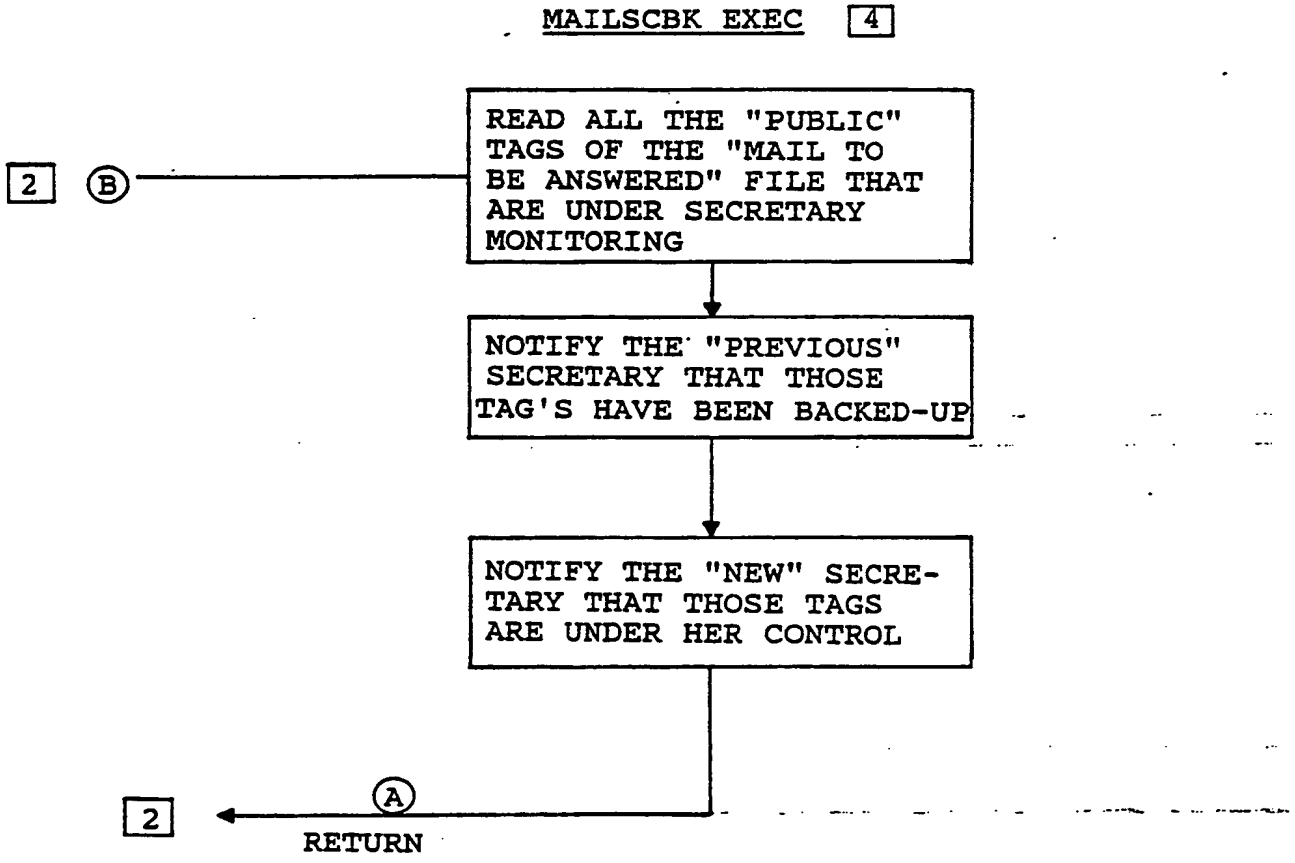
FIG. 4


MAIL FOLLOW-UP APPLICATION LOADING
INITIALISATION SCREEN. STEPS AUTOMATICALLY TO THE NEXT
MAIL TO BE ASSIGNED
PF7 >
< PF3
TAG CREATION
< PF3
PF3 v
PF5 ^
PF7 >
MAIL TO BE ANSWERED
PF8 >
< PF5
DELEGATION SCREEN
PF12 >
PF3 v
EXIT TO OTHER APPLICATIONS
< PF3
MORE INFORMATION

F I G. 5



F I G. 9



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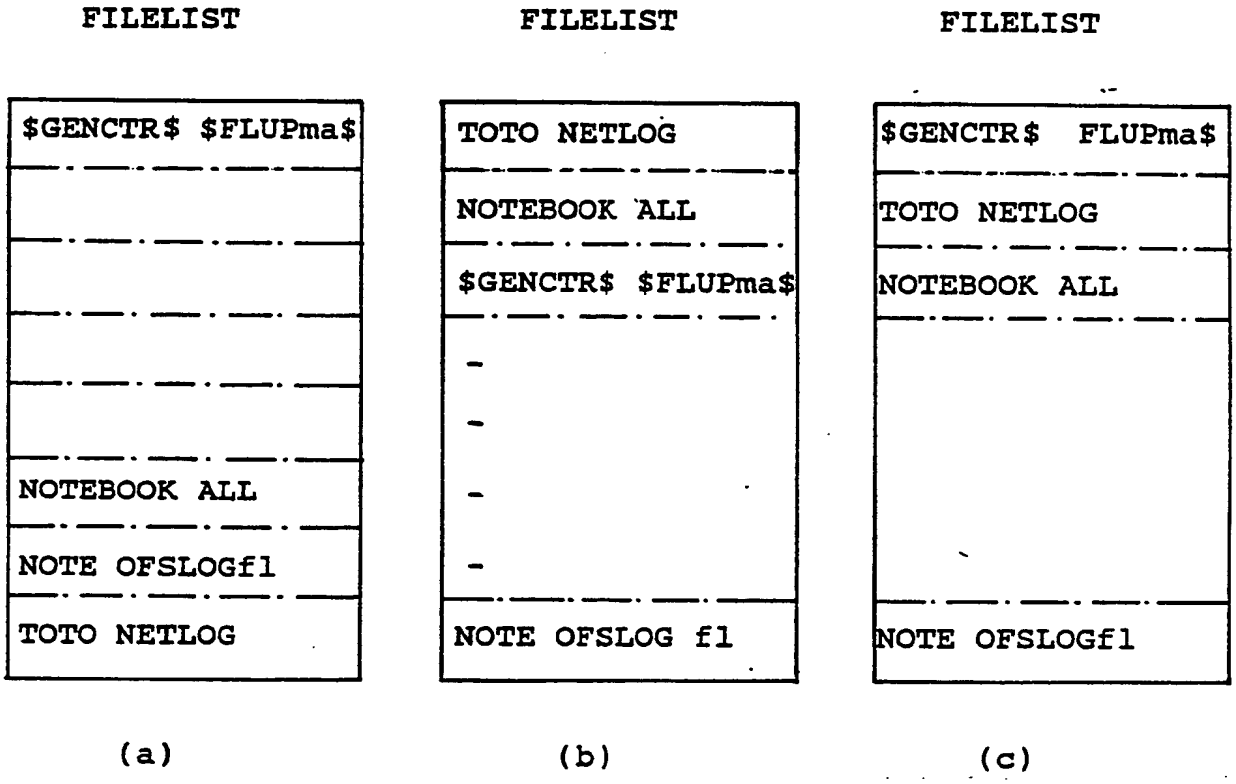
BNSDOCID: <EP__0346556A1_I_>

FIG. 6



BNSDOCID: <EP___0346556A1_I_>

MAILROUT EXEC [2]

FIG. 7

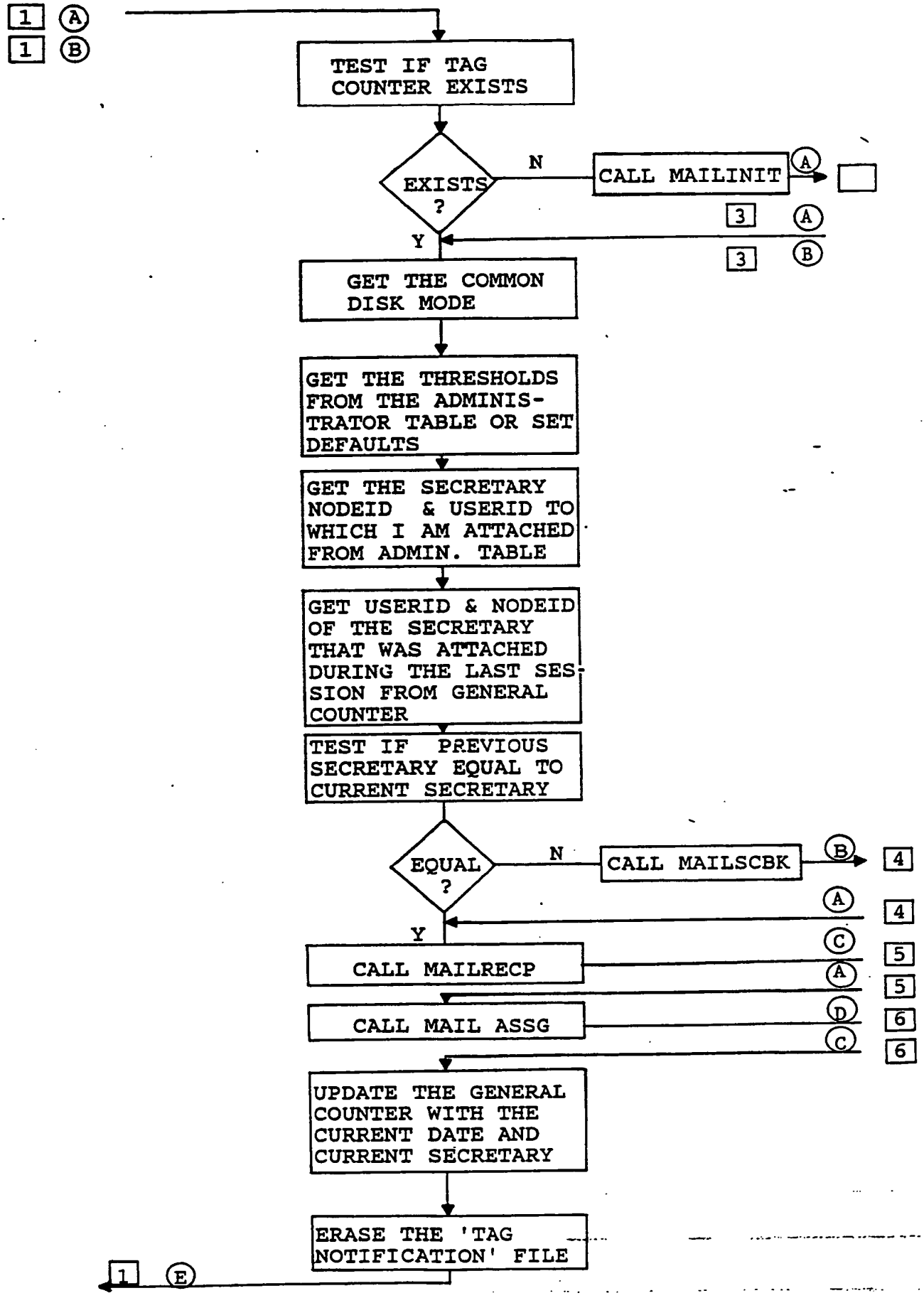
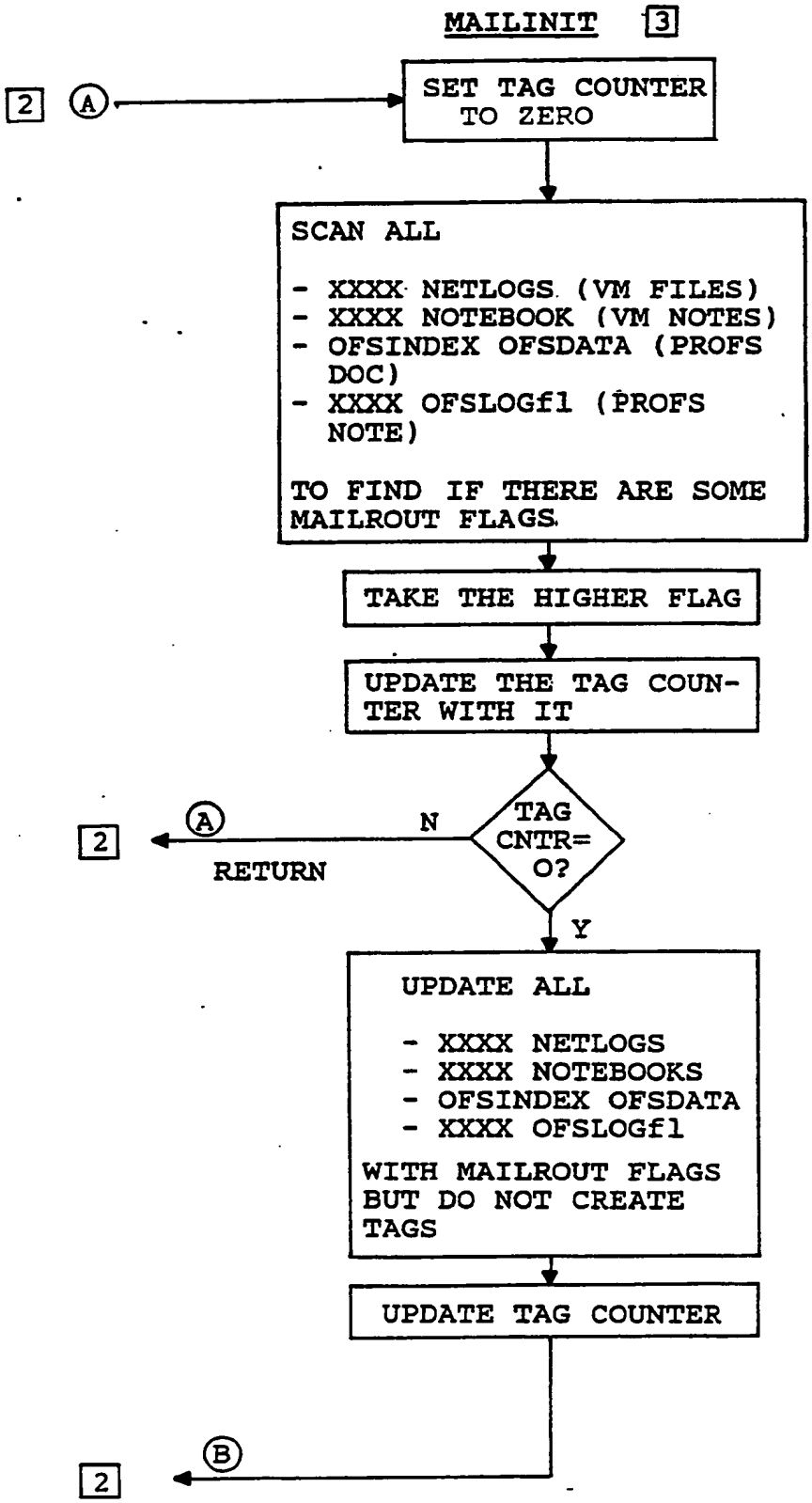


FIG. 8



BNSDOCID: <EP___0346556A1_I_>

FIG. 10A

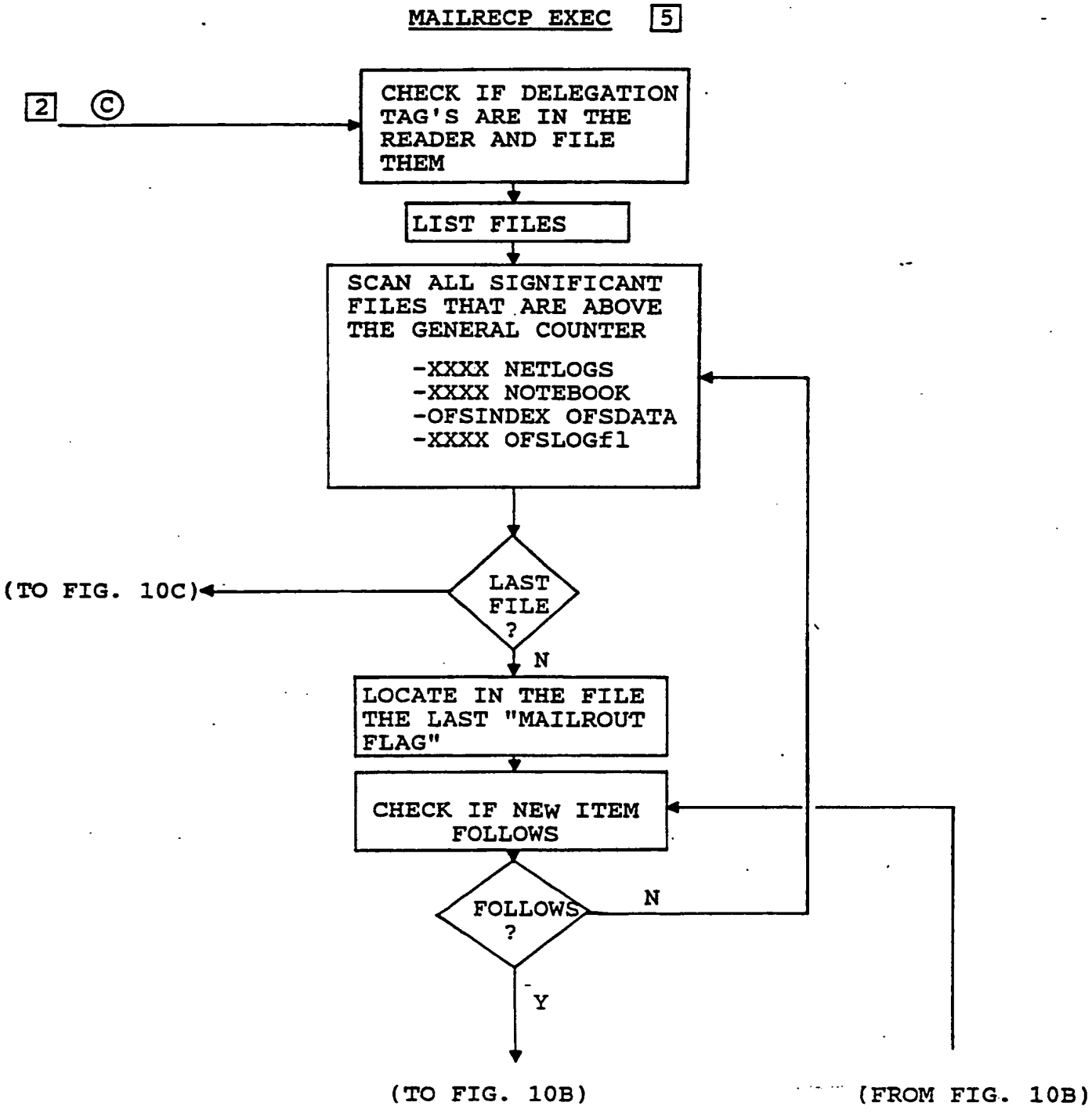
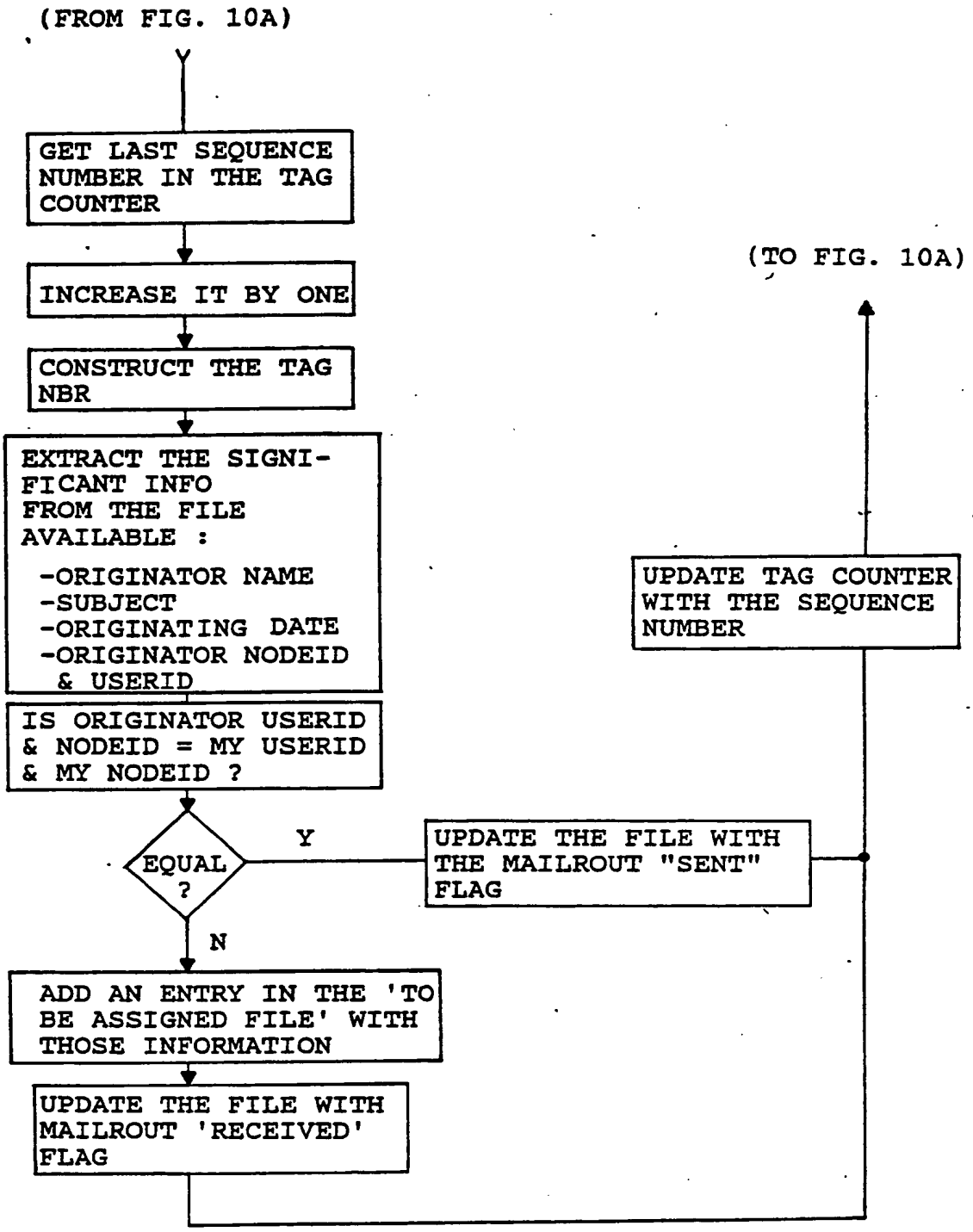

MAILRECP EXEC 5
2 ©
CHECK IF DELEGATION TAG'S ARE IN THE READER AND FILE THEM
LIST FILES
SCAN ALL SIGNIFICANT FILES THAT ARE ABOVE THE GENERAL COUNTER
-XXXX NETLOGS
-XXXX NOTEBOOK
-OFSINDEX OFSDATA
-XXXX OFSLOGf1
LAST FILE ?
(TO FIG. 10C)
N
LOCATE IN THE FILE THE LAST "MAILROUT FLAG"
CHECK IF NEW ITEM FOLLOWS
FOLLOWS ?
N
Y
(TO FIG. 10B)
(FROM FIG. 10B)

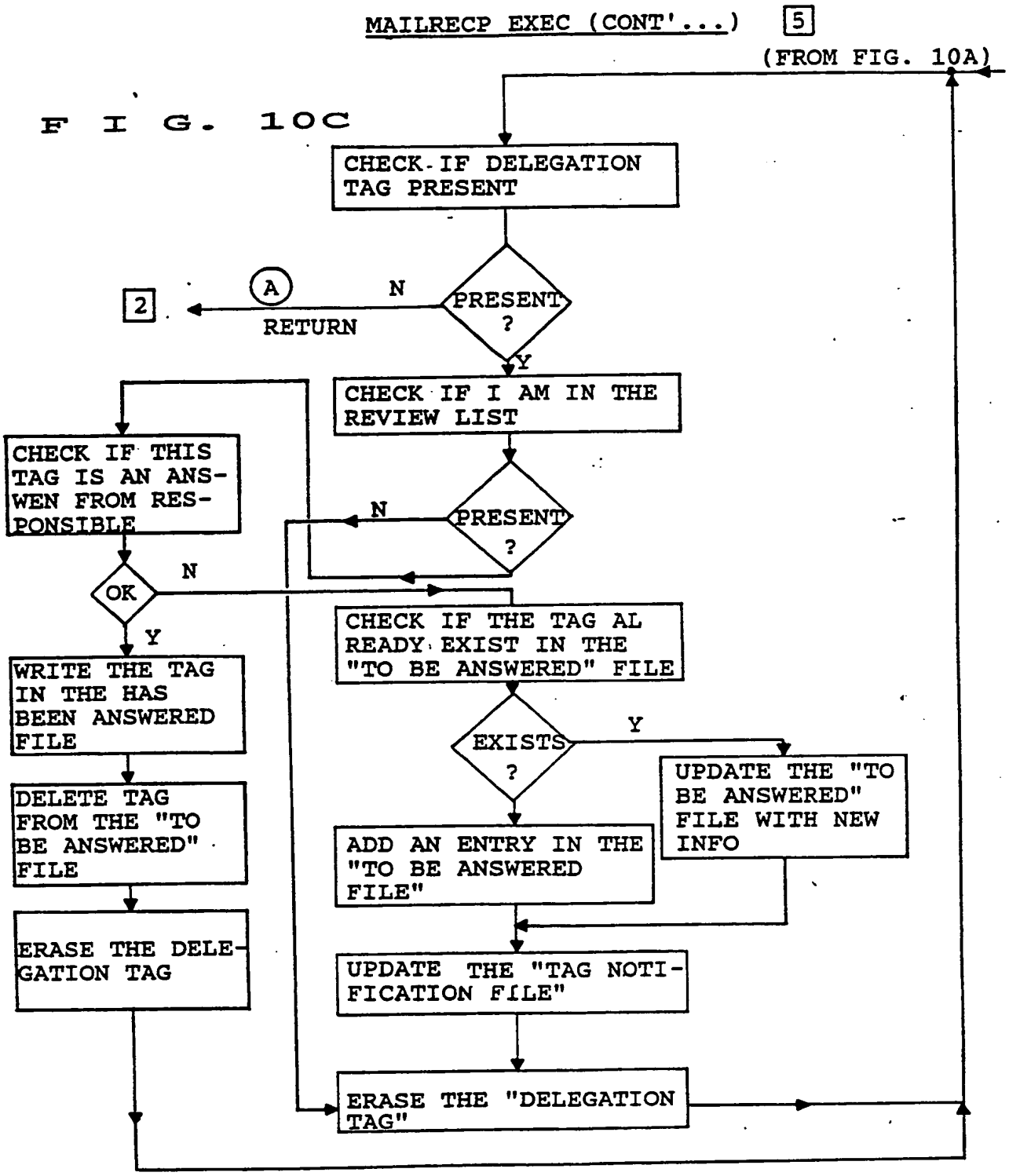
FIG. 10B

MAILRECP EXEC (CONT'... 5)



BNSDOCID: <EP___0346556A1_I_>

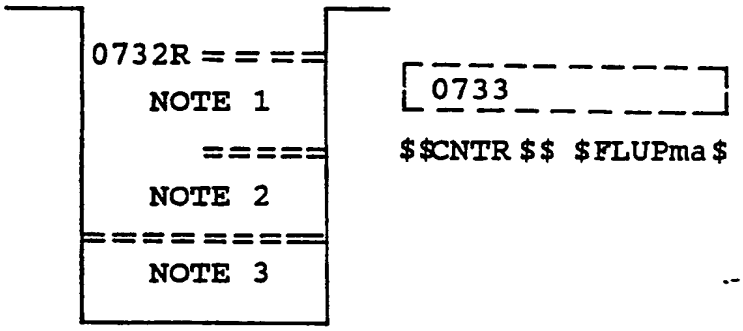
FIG. 10C



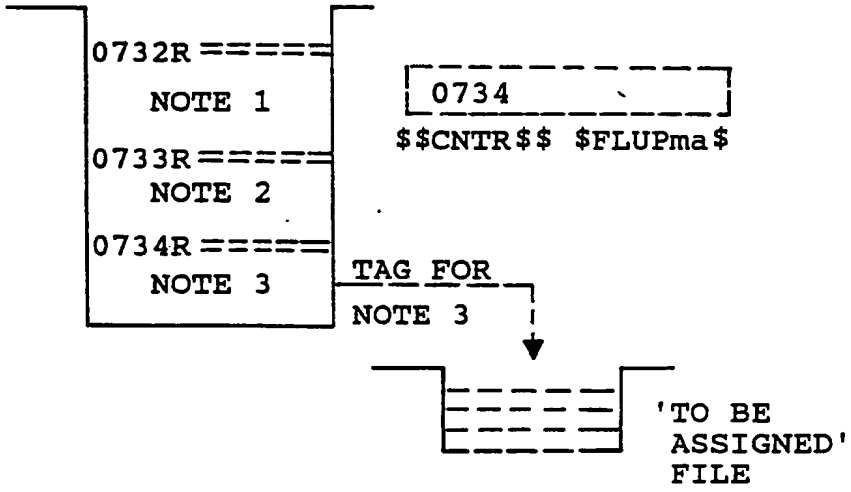
BNSDOCID: <EP 0346556A1>

FIG. 11

(A)

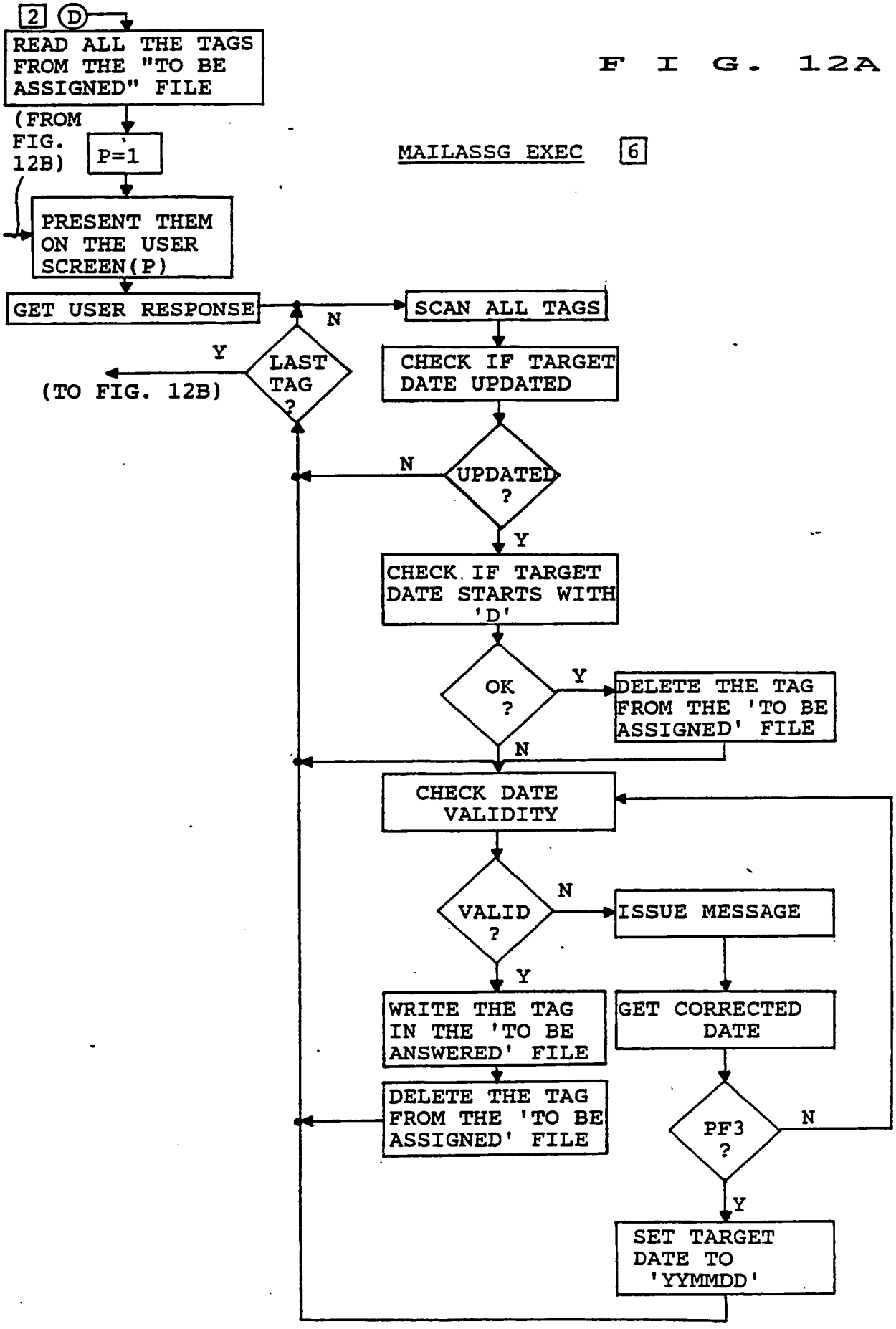


(B)



BNSDOCID: <EP__0346556A1_>

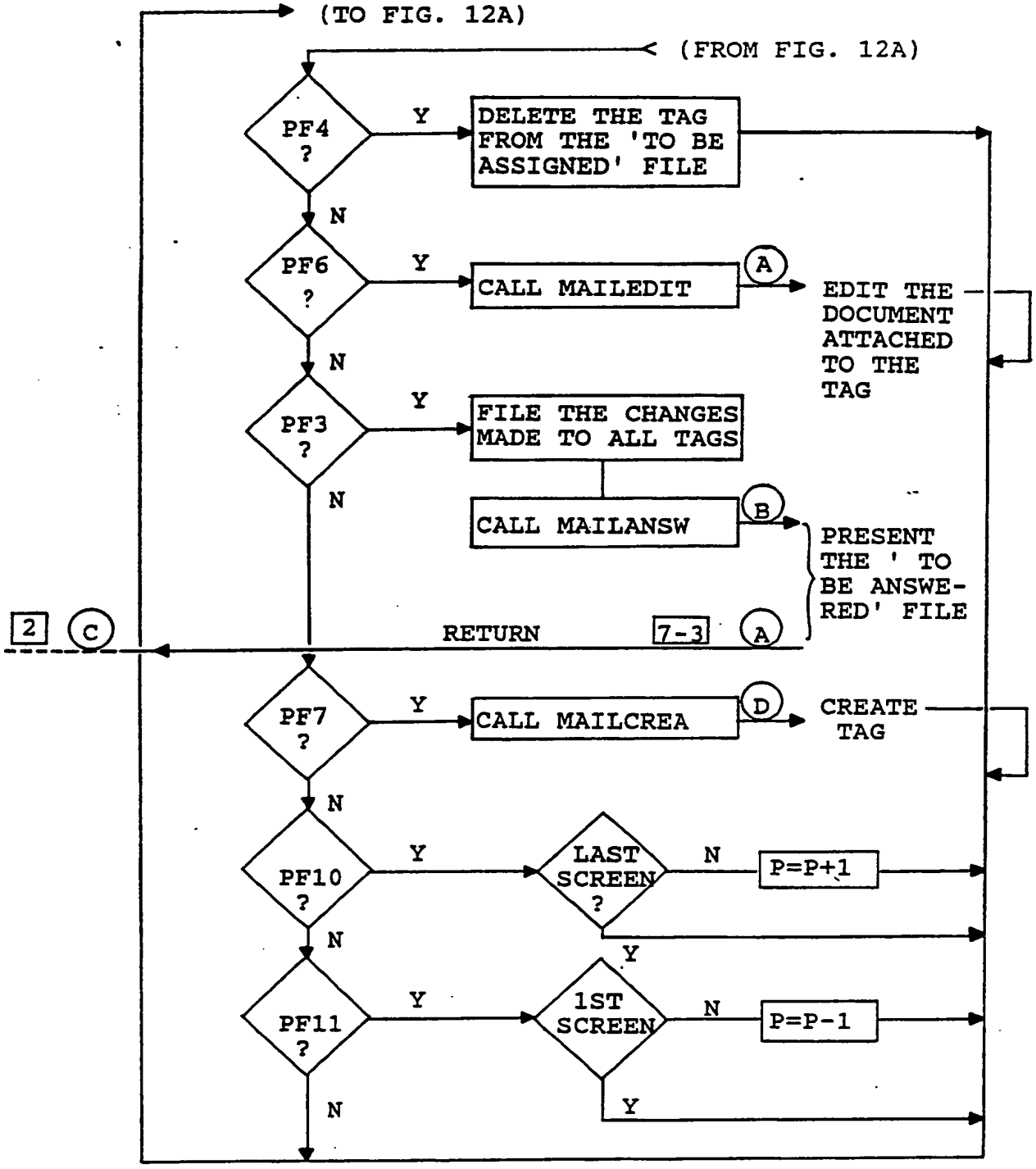
FIG. 12A



BNSDOCID: <EP__0346556A1_I_>

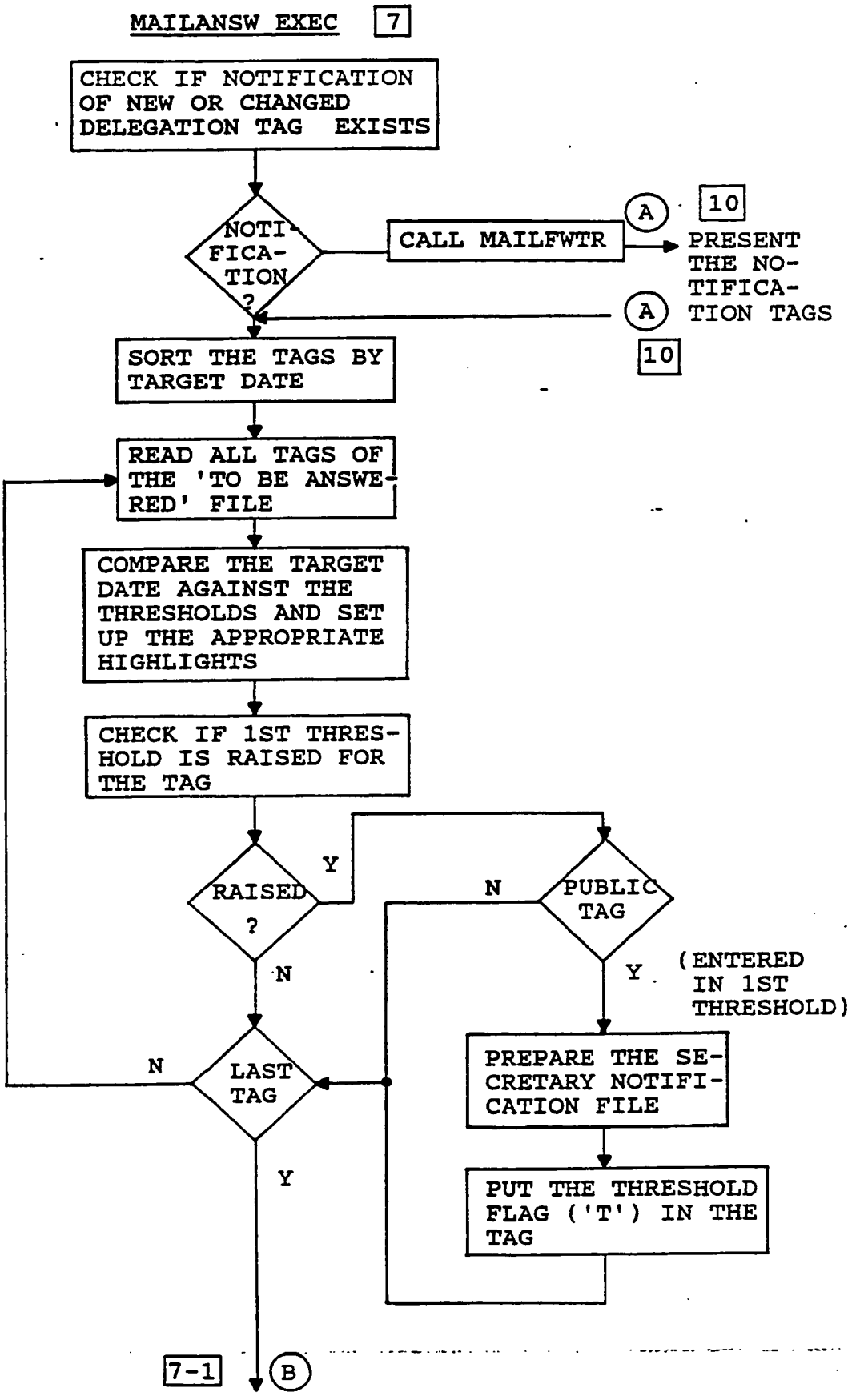
FIG. 12B

MAILASSG EXEC (CONT'... 6)



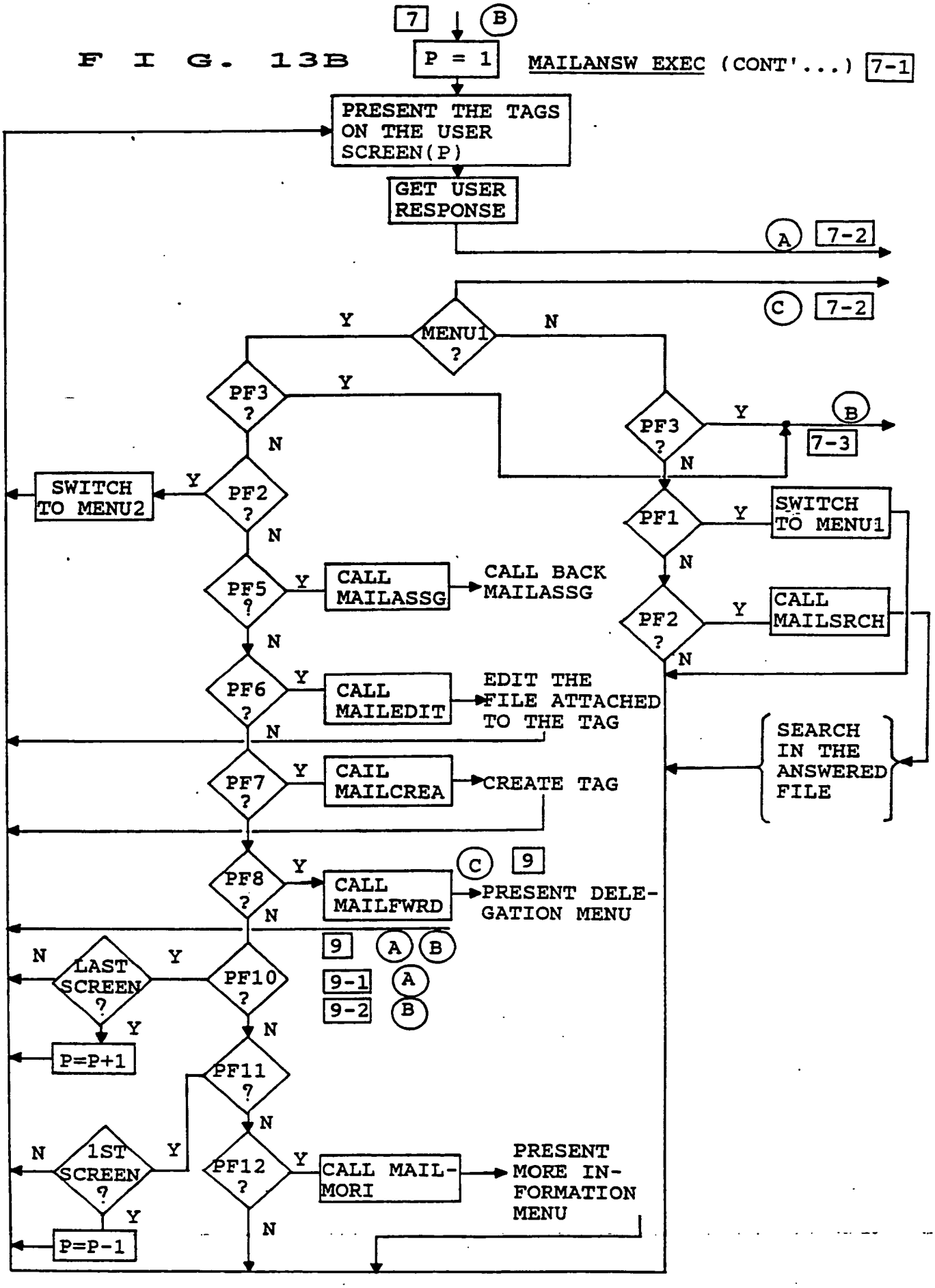
3NSDOCID: <EP___0346556A1_I_>

FIG. 13A



BNSDOCID: <EP___0346556A1_I_>

FIG. 13B



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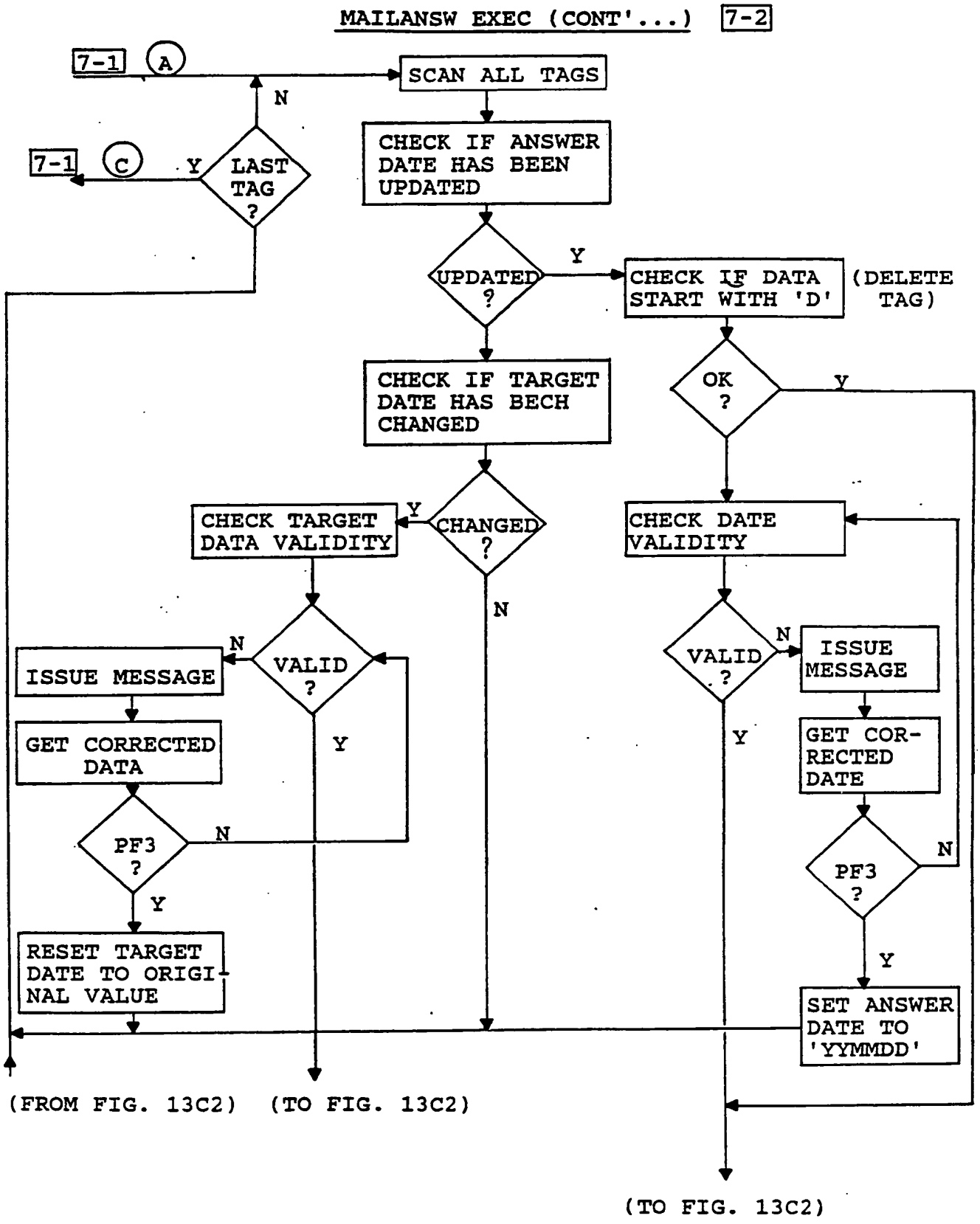
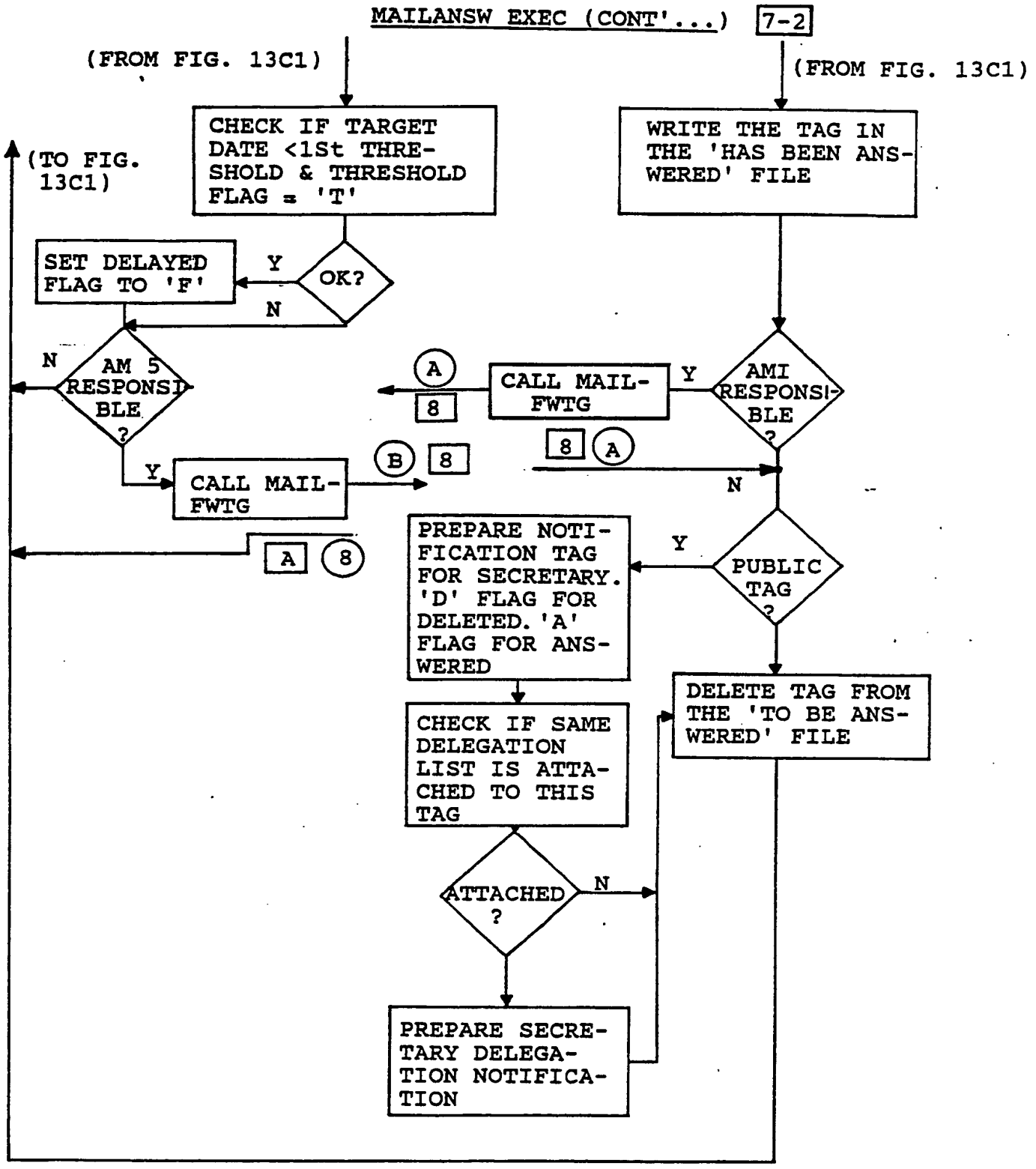
BNSDOCID: <EP___0346556A1_I_>

FIG. 13C1



BNSDOCID: <EP___0346556A1_I_>

FIG. 13C2



BNSDOCID: <EP__0346556A1_I_>

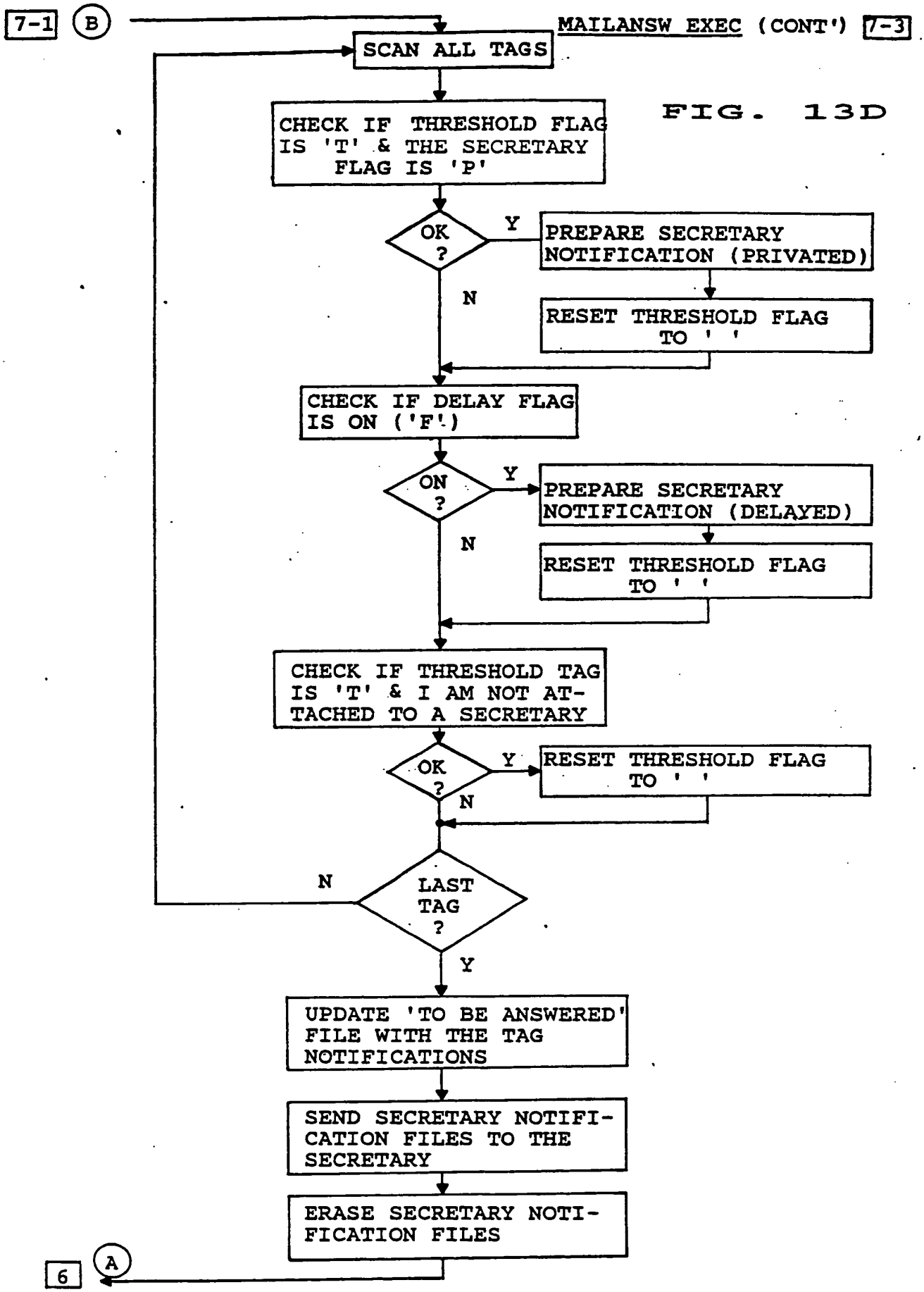


FIG. 13D

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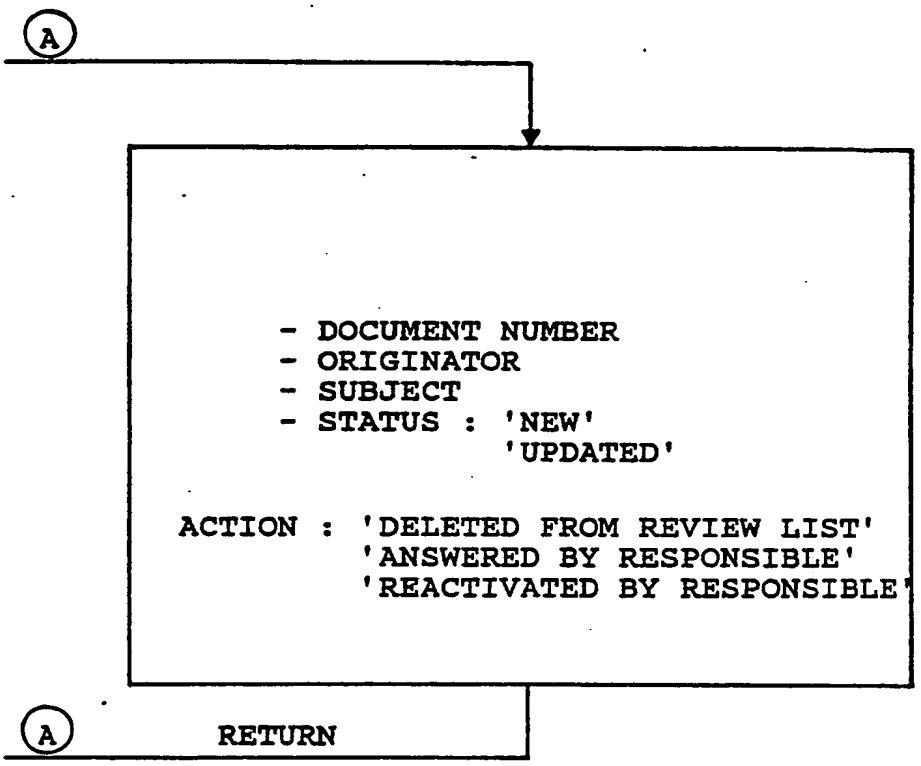
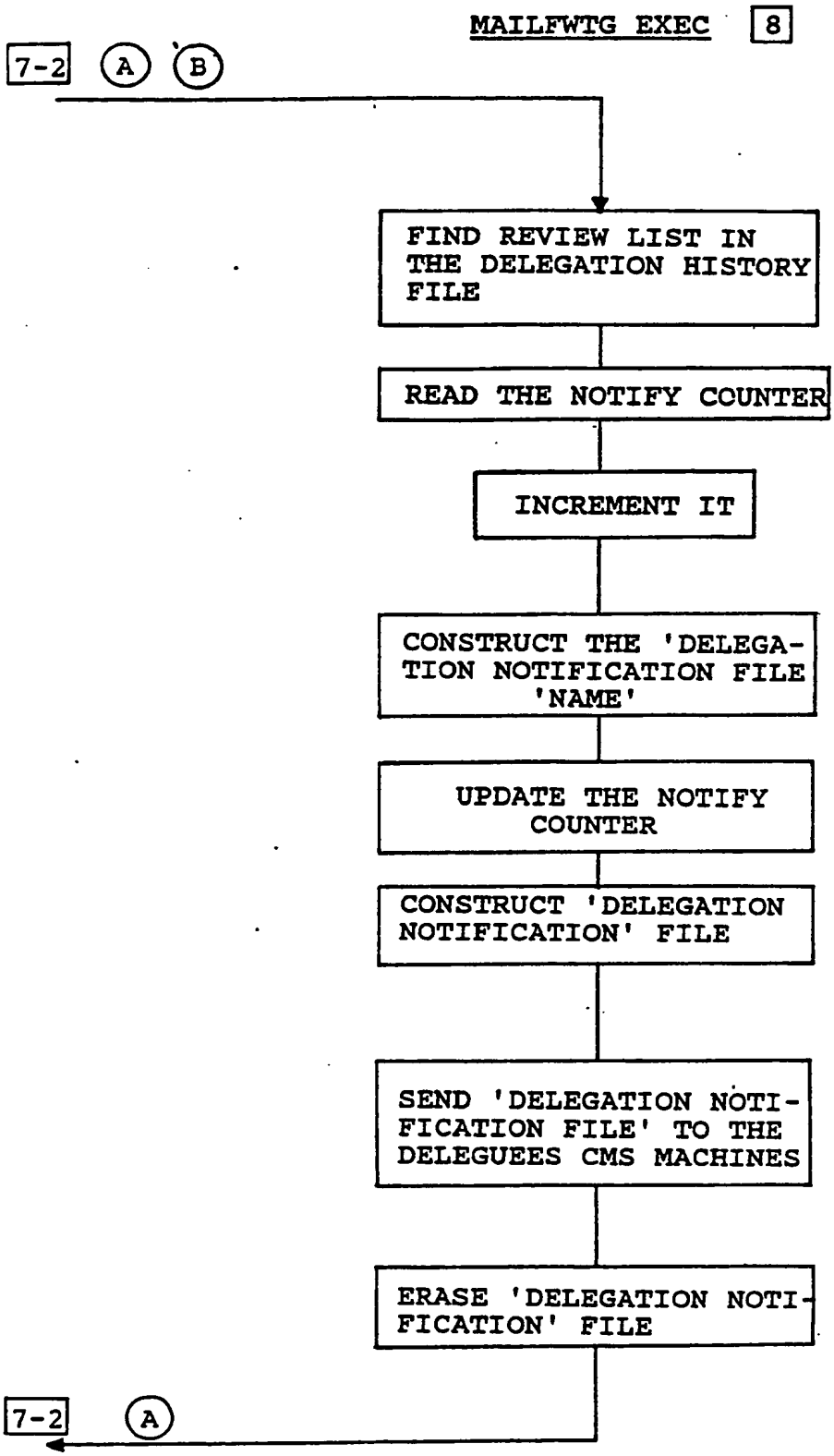
FIG. 14

MAILTWTR EXEC 10



BNSDOCID: <EP___0346556A1_I_>

FIG. 15



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BNSDOCID: <EP___0346556A1_I_>

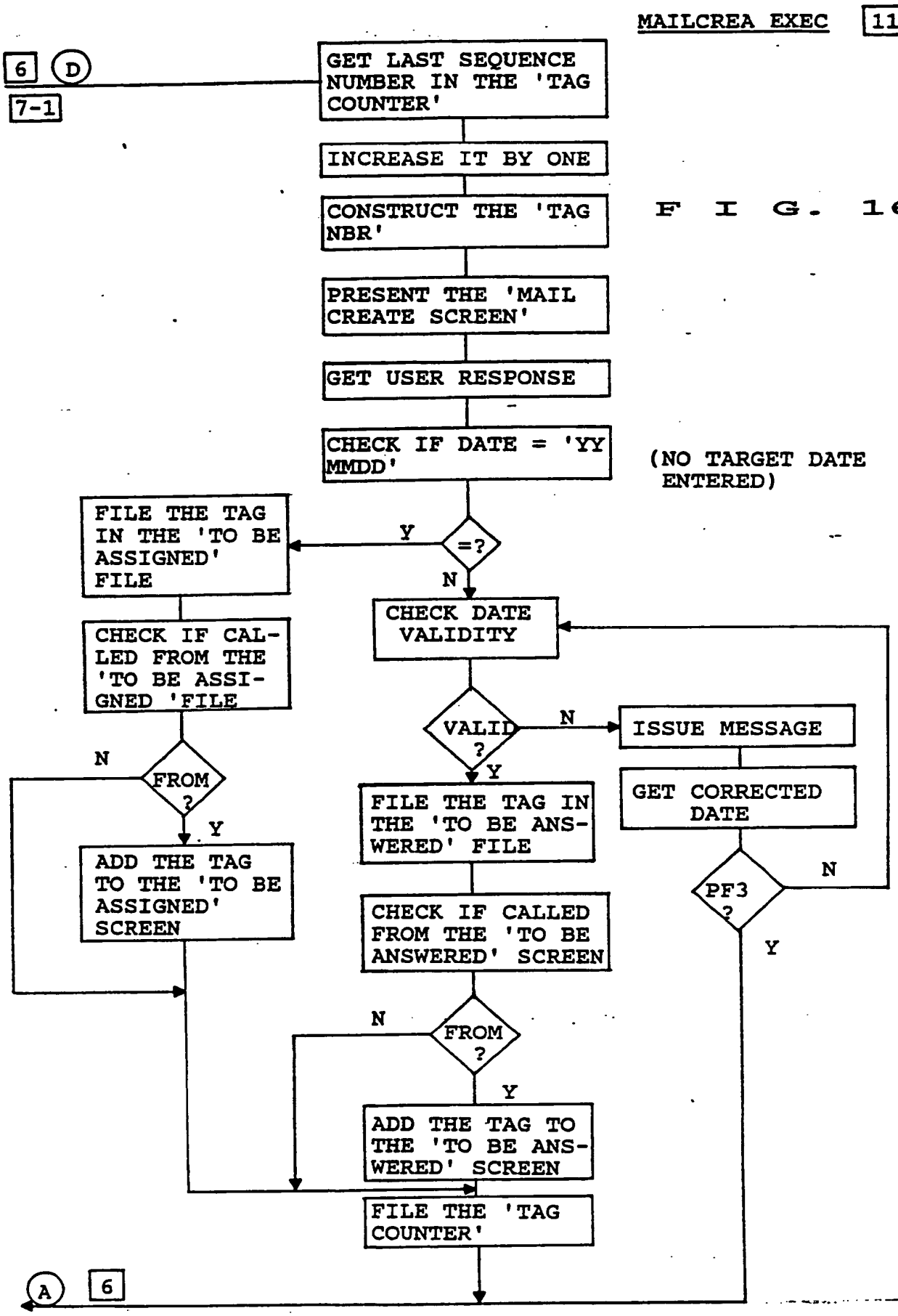

FIG. 16

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BNSDOCID: <EP___0346556A1_I_>

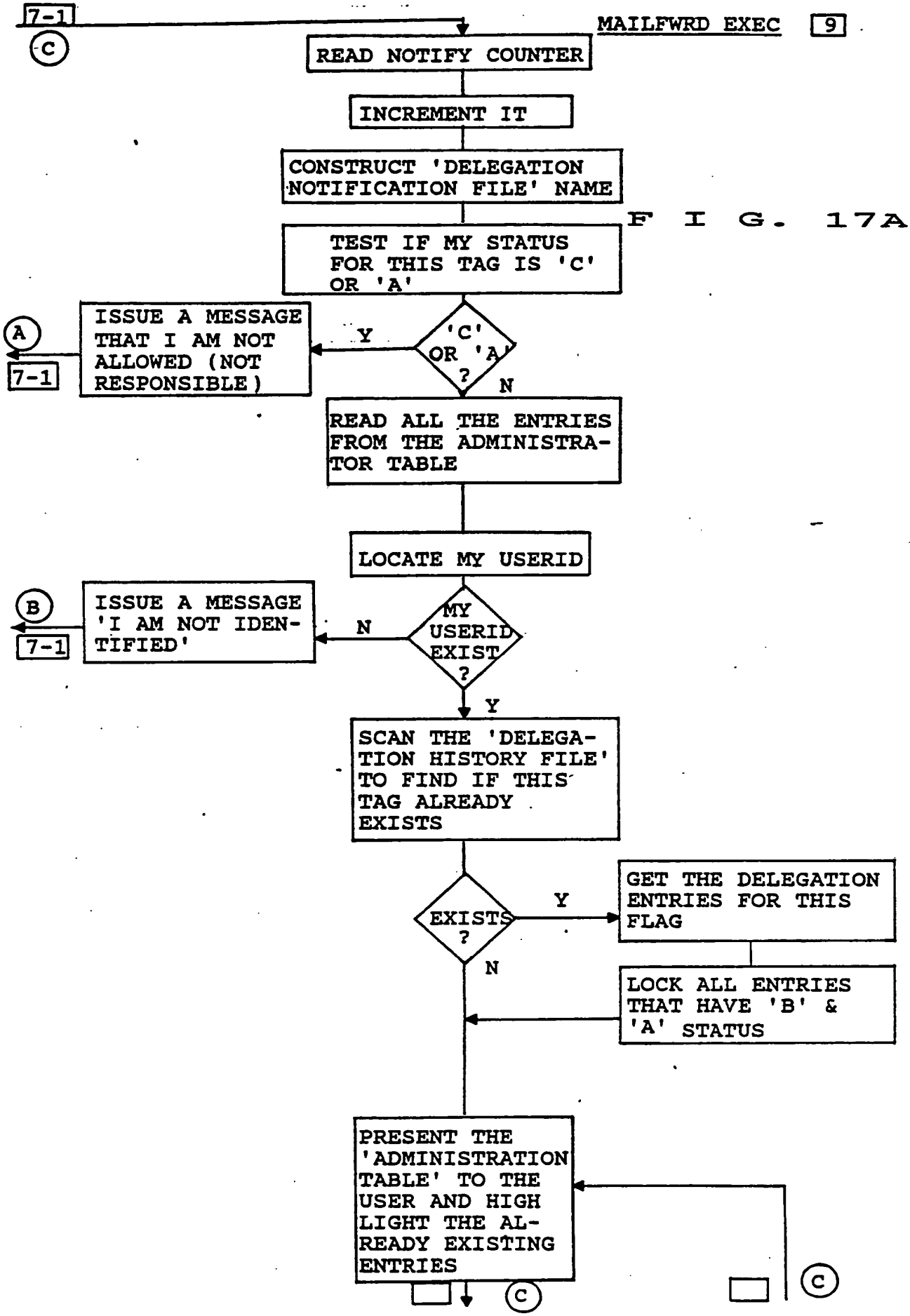
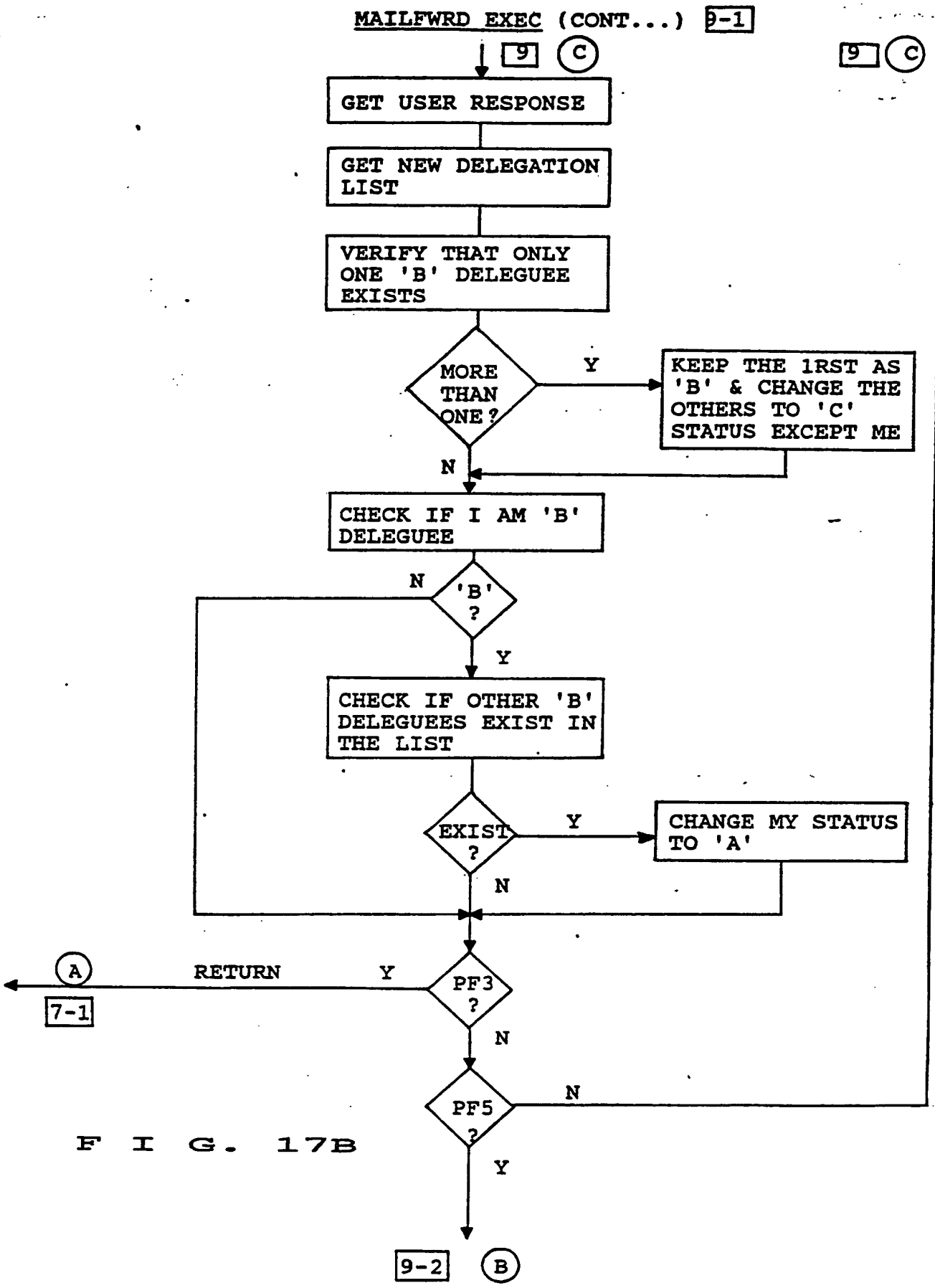


FIG. 17A

BNSDOCID: <EP___0346556A1_I_>



F I G. 17B

BNSDOCID: <EP___0346556A1_I_>

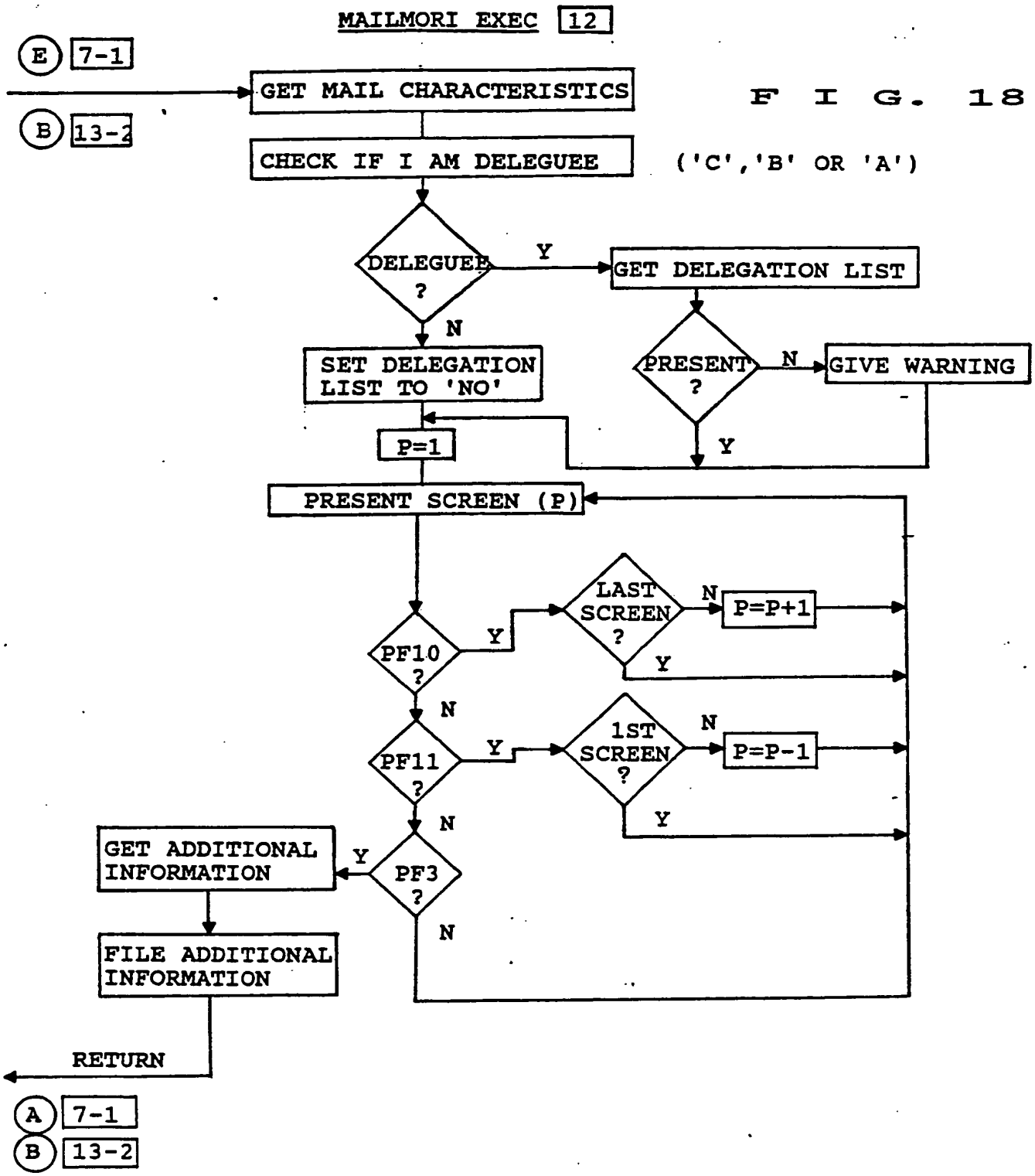


FIG. 18

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MAILSRCH EXEC 13-1

FIG. 19A

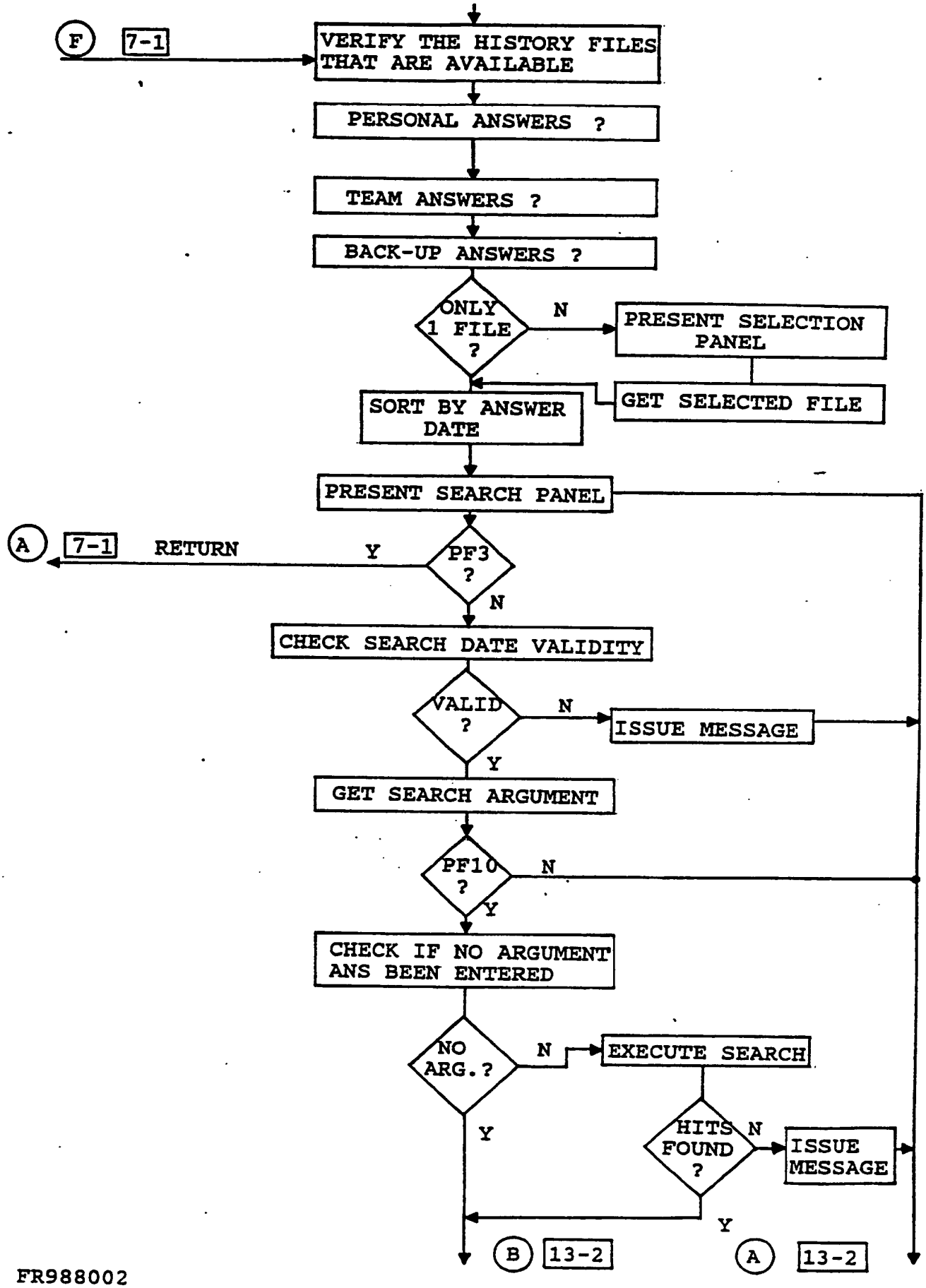

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FIG. 19B

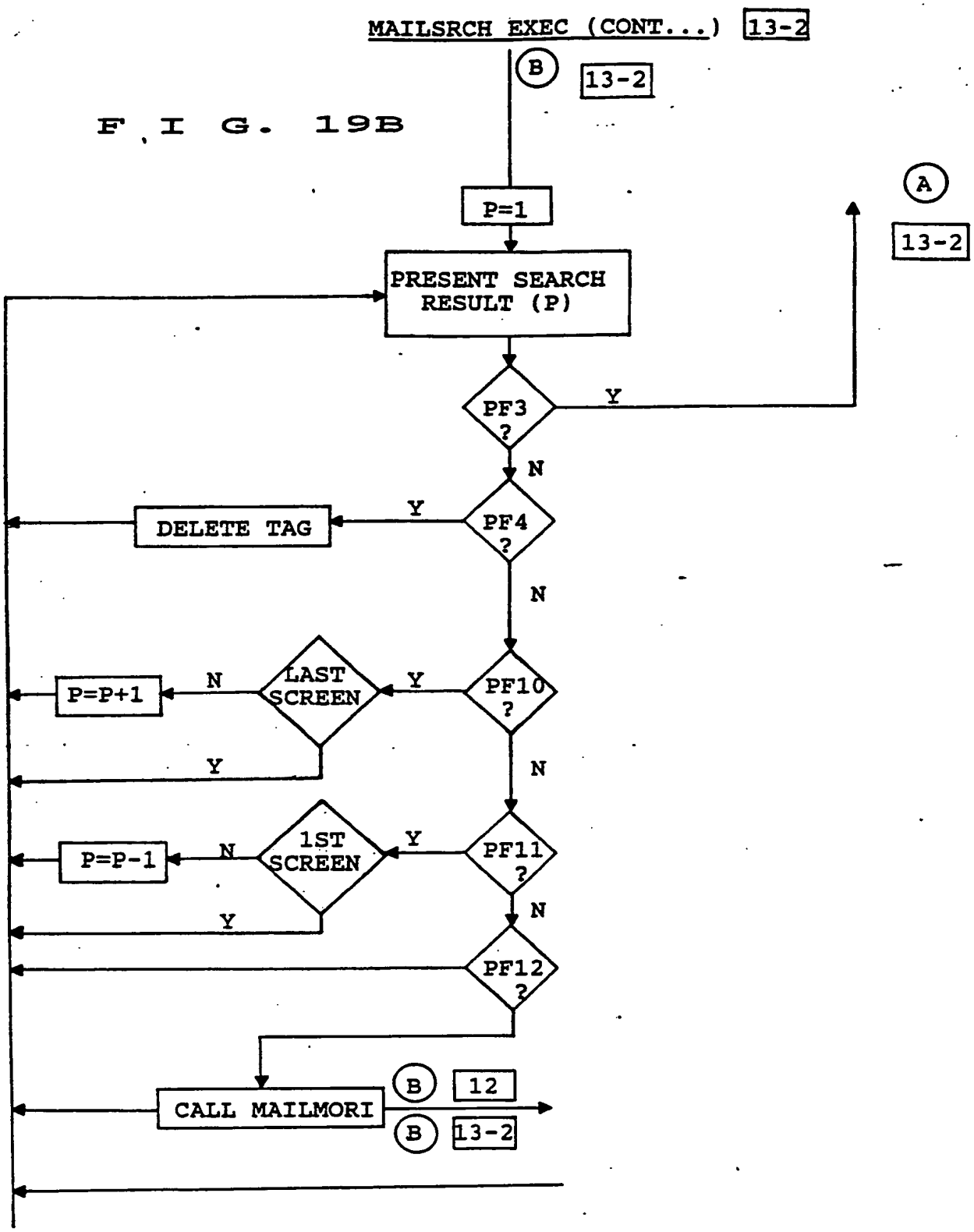

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FIG. 20

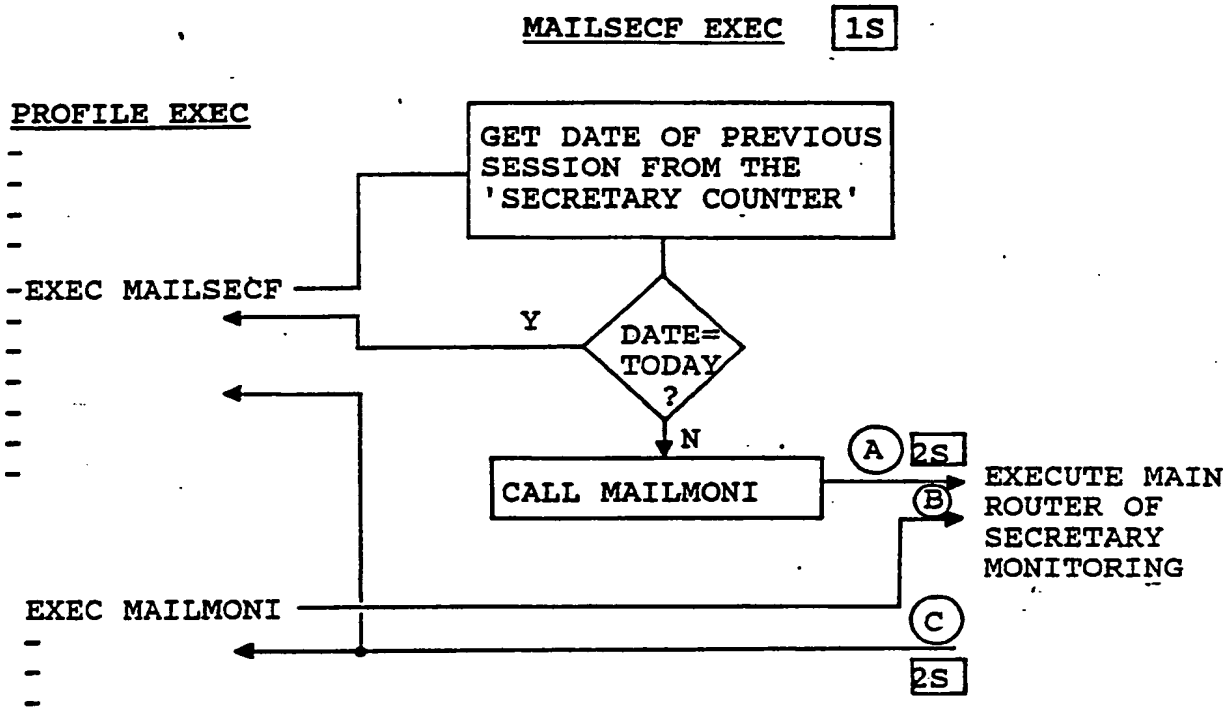
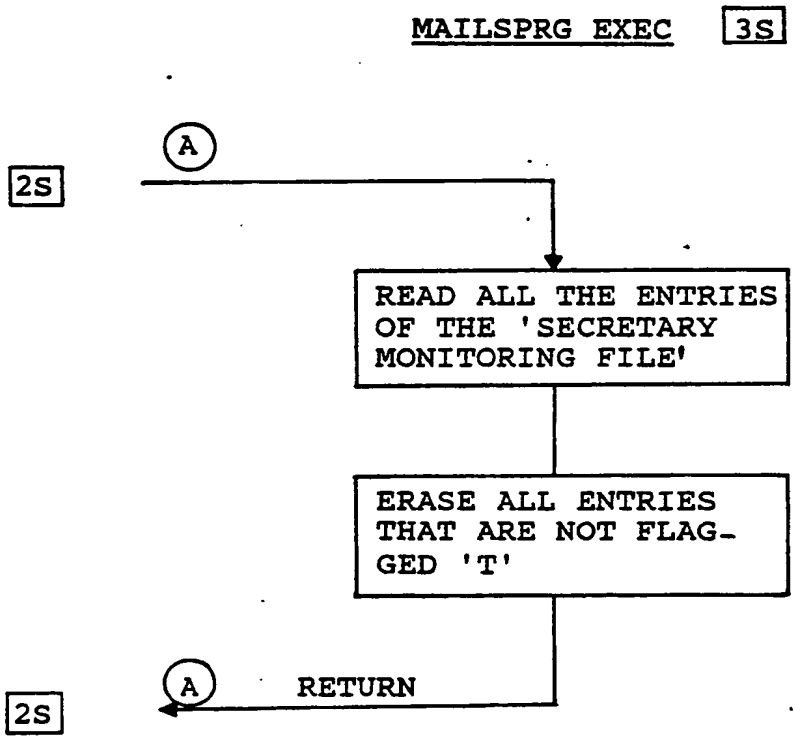
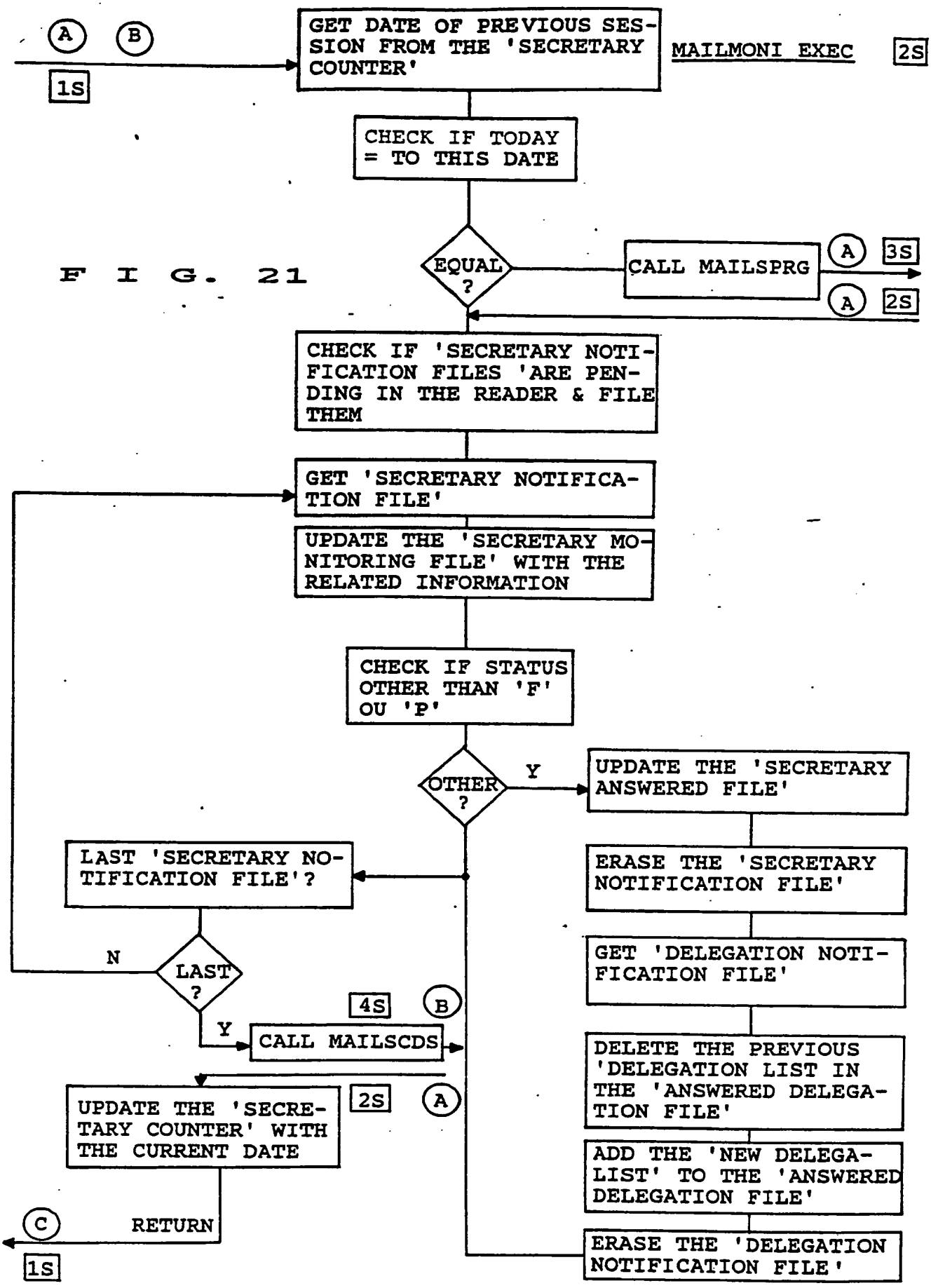


FIG. 22



BNSDOCID: <EP___0346556A1_I_>



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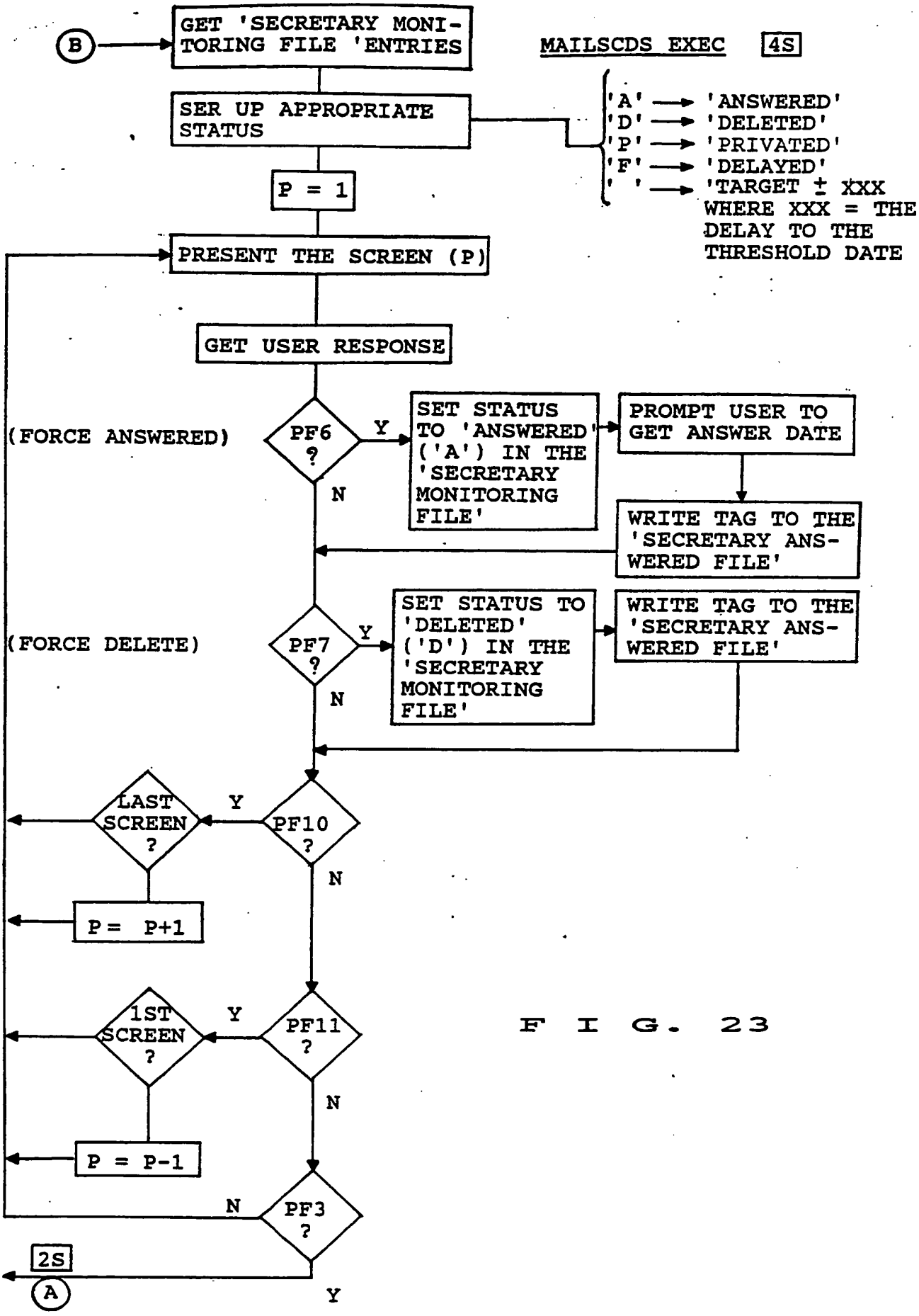

FIG. 23

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 48 0016

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	FR-A-2 337 377 (IBM) * Page 2, lines 2-5; page 3, lines 6-27; page 4, lines 4-15; page 5, lines 26-34; page 6, lines 5-9; page 7, lines 5-7; page 8, lines 35-40 *	1-4,13-15	H 04 L 11/20 G 06 F 15/40
A	INTERNATIONAL SWITCHING SYMPOSIUM 1987, "Innovations in switching technology", Phoenix, Arizona, 15th-20th March 1987, pages 564-570, IEEE, New York, US; H. KAUFFELDT: "Meridian information services: evolution towards networking" * Page 566, left-hand column, lines 5-15 *	1-5	
A	ICC'84, "Links for the future", Amsterdam, 14th-17th May 1984, vol. 1, pages 109-114, IEEE, New York, US; D.R. McKNIGHT: "The envoy family of value added services" * Page 109, right-hand column, lines 16-37; page 110, right-hand column, lines 26-40 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4) H 04 L G 06 F
A	PATENT ABSTRACTS OF JAPAN, vol. 9, no. 56 (E-302)[1779], 12th March 1985; & JP-A-59 196 647 (TOSHIBA K.K.) 08-11-1984 * Abstract *	1,2	
A,P	GB-A-2 203 571 (TRIDENT TRADE AND MANAGEMENT SERVICES LTD) * Page 2, lines 7-10; page 3, lines 18-30; figure 1 *	1-5	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24-02-1989	DE LA FUENTE DEL AGUA P.

CATEGORY OF CITED DOCUMENTS

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